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PB-260 135

METHODOLOGY IN TWO CALIFORNIA HEALTH SURVEYS
SAN JOSE (1952) AND STATEWIDE (1954-55)

Public Health Service, Washington, D. C.

1955

RA11
.P
no. 942

PB 260 135

Robert A. Taft Sanitary Engineering Center
4676 Columbia Parkway, Cincinnati 26, Ohio

PUBLIC HEALTH MONOGRAPH NO. 70

Methodology in Two California Health Surveys

U. S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

PUBLIC HEALTH SERVICE

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BIBLIOGRAPHIC DATA SHEET	1. Report No.	2.	3. Recipient's Accession No. PB-260 135
4. Title and Subtitle Methodology in Two California Health Surveys, San Jose (1952) and Statewide (1954-55).			5. Report Date 1955
			6.
7. Author(s) H. William Mooney			8. Performing Organization Rept. No. PHS-M-70
9. Performing Organization Name and Address Public Health Service, Washington, D. C.			10. Project/Task/Work Unit No.
			11. Contract/Grant No.
12. Sponsoring Organization Name and Address			13. Type of Report & Period Covered Monograph
			14.

15. Supplementary Notes

Portions of this document are not fully legible.

16. Abstracts

The methodological results of a survey conducted in San Jose, California, in 1952 and of the statewide California Health Survey of 1954-1955 are analyzed. The 1952 survey was devoted to studying and evaluating methods of measuring illness and disability. The second applied throughout California the principles developed in San Jose and explored further methodological issues. The report describes the major findings from the 1952 survey and includes statewide results extending the earlier findings.

17. Key Words and Document Analysis. 17a. Descriptors

17b. Identifiers/Open-Ended Terms

San Jose (California)
California
Government agencies
*Public health
Attitude surveys
*Data acquisition
State government

17c. COSATI Field/Group 6E

18. Availability Statement	19. Security Class (This Report) UNCLASSIFIED	21. No. of Pages 160
	20. Security Class (This Page UNCLASSIFIED	22. Price

FORM NTIS-35 (REV. 10-73) ENDORSED BY ANSI AND UNESCO. THIS FORM MAY BE REPRODUCED USCOMM-DC 8265-P74

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Methodology in Two California Health Surveys

San Jose (1952) and Statewide (1954–55)

H. William Mooney, Ph.D.

Public Health Monograph No. 70

The Author

Dr. Mooney is a survey research specialist in the bureau of maternal and child health, division of preventive medical services, California Department of Public Health.

Public Health Service Publication No. 942

Library of Congress Catalog Card No. 63-60039

UNITED STATES GOVERNMENT PRINTING OFFICE : 1962

For sale by the Superintendent of Documents, U.S. Government Printing Office,
Washington 25, D.C.—

Foreword

The U.S. National Health Survey in the Public Health Service was given authority in a part of the National Health Survey Act "to develop and test new or improved methods for obtaining current data on illness and disability and related information." It therefore seemed desirable for the survey to support in every way possible the analysis and publication of the methodological results of the survey conducted in San Jose in 1952, and the statewide California Health Survey of 1954–55.

The first of these surveys was devoted wholly to studying and evaluating methods of measuring illness and disability. The second applied throughout California the principles developed in San Jose and explored further methodological issues.

The U.S. Bureau of the Census had participated in the planning and conduct of these two surveys and was asked to undertake a similar function at the time the nationwide Health Interview Survey was being planned in 1956–57. The California State Department of Public Health gave its wholehearted support to use of the data from the two surveys for methodological analyses and planning purposes. It was thus possible for the Public Health Service and Census staffs to draw freely upon the results of these surveys, and they were extremely valuable.

Consequently, it is a great satisfaction to the U.S. National Health Survey to sponsor the publication of this report as a Public Health Monograph.

THEODORE D. WOOLSEY, *chief,*
National Health Survey Division,
National Center for Health Statistics.

Acknowledgments

For both the 1952 San Jose Survey and the California Health Survey of 1954–55, the California Department of Public Health contracted with the Bureau of the Census to design the sample, to prepare questionnaires and instructions, to carry out the fieldwork, and to provide consultive services. Harold Nisselson and Mrs. Katherine G. Capt of the Census Bureau staff carried primary responsibility for these functions.

Theodore D. Woolsey of the Public Health Service provided helpful advice during the planning and analysis of both surveys. He and his U.S. National Health Survey staff reviewed the present report and made many useful comments.

In the California Department of Public Health, Dr. Lester Breslow, project director for both the San Jose and California Health Surveys, provided stimulating leadership in formulating survey goals and in implementing the survey fieldwork and analysis. Persons representing the interests of the California Medical Association, California Physicians' Service, Association of California Hospitals, University of California School of Public Health, California Conference of Local Health Officers, State Department of Employment, State Department of Industrial Relations, and other agencies served as an advisory committee to the California Department of Health during the planning and conduct of the two surveys.

Arthur Weissman was supervisor of the San Jose Survey, which served as the pilot operation for the 1954–55 California Health Survey, and he provided helpful counsel during the preparation of this report. George I. Allen performed the initial analyses of the household survey data from the San Jose Survey, and Mrs. Nedra B. Belloc was responsible for the initial analyses of data from San Jose medical record sources. Mrs. M. E. Laughlin aided in devising the coding scheme for the Post Enumeration Survey and in making initial tabulations of data. Mrs. Beverlie M. Vandre, Leon Regelson, and Mrs. Beatrice Pollack prepared most of the data included in this monograph. In addition, Mrs. Pollack contributed substantially to the preparation of the tabular and written materials.

Dr. Leslie Kish, Survey Research Center, University of Michigan, provided helpful comments on the present report.

The author was supervisor of the statewide California Health Survey from 1954 to 1956. He prepared this monograph based on the results of the two surveys and carried out the analyses contained herein. While many people contributed to the successful completion of the surveys and helped with advice on the interpretation of the findings, the author accepts final responsibility for the conclusions that have been drawn.

This investigation was supported in part by research grant RG–1792 from the National Institutes of Health, Public Health Service.

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Symbols and Notes

Data not available (three dashes)	- - -
Category not applicable (three dots)	. . .
Quantity is zero (one dash)	—
Magnitude greater than zero but less than one-half of the unit used	0 or 0.0

NOTES: Detailed figures within tables may not add to totals because of rounding.

The "measure of sample size" given in data tables is for use in standard error calculations (see appendix A).

Introduction

Morbidity data are used as guides in a wide variety of studies and programs. Among these are administrative planning and evaluation of health programs, provision of medical care, epidemiologic studies, studies of manpower needs and utilization, and health education programs (*1,2*).

A need for morbidity statistics applicable to broad population groups has existed for some time. Indeed, the first known attempts to collect data on sickness in the United States were in connection with the Federal censuses of 1880 and 1890. These two endeavors provided an early indication that morbidity surveys were fraught with methodological problems. The judgment pronounced by an official of the Census Bureau was that "These attempts to receive statistics of morbidity through the instrumentality of the census were complete failures and will, it is safe to say, never be repeated" (*3*). The succeeding decades witnessed an increasing number of surveys conducted with the specific intent of obtaining morbidity and related information (*4*). Recent surveys in the United States and Canada are described in annual reports of the Clearinghouse on Current Morbidity Statistics Projects of the Public Health Service (*5*).

The California Department of Public Health had long felt the need for current and reliable information on the types and distribution of illnesses in the general population of the State. As early as 1870 the California State Board of Health made an interesting but unsuccessful attempt to obtain current knowledge of disease prevalence. (The board tried to collect illness and mortality data from the sickness benefit programs of the local lodges of the International Order of Oddfellows.) During the investigation of the chronic disease problem in California in 1948, the department and cooperating professional societies and voluntary health agencies were made acutely aware of the lack of adequate morbidity data for heart disease, cancer, diabetes, and other chronic conditions. In other areas of interest as well, progress was retarded by the lack of adequate morbidity data and the absence of an established mechanism for getting such data. Accordingly, the department began to explore the possibilities of undertaking a research program in the field of morbidity measurement. Its objective was to devise a feasible mechanism through which morbidity data could be gathered on a current basis.

During 1948 and 1949 the California Department of Public Health, with the assistance of the Public Health Service and the University of California School of Public Health, explored the possibility of undertaking research in the field of morbidity measurement and developed the plans for a research project. The project was to evaluate morbidity data from household surveys and from existing medical records.

In 1950 the department activated a research grant from the National Institutes of Health. With the assistance of an advisory committee representing the interests of physicians and State and private agencies, the department planned a methodological investigation in San Jose, Calif. The Bureau of the Census supplied consultive services and conducted the sample survey fieldwork on a contract basis. Collection of medical record data for San Jose residents commenced in 1951, and an investigation of alternative household survey methods took place in early 1952.

Results from the San Jose Survey aided in the design of a statewide survey. This California Health Survey, with the Bureau of the Census again providing technical consultation and fieldwork, started in May of 1954 and continued for 1 year. The statewide survey provided a demonstration of the household sample survey method at the level of an operating program and provided further information on some of the methodological topics covered by the San Jose Survey.

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In 1957 the department completed a report of some of the major substantive findings from the California Health Survey (*6*). The present report describes the major findings from the San Jose Survey, and includes California Health Survey methodological results extending these earlier findings.

Methodological Issues Investigated

In planning the San Jose Survey, it was possible to draw upon a considerable methodological lore derived from earlier morbidity surveys. It was also clear that many of the methodological problems were the same as those found in other fields of application, and that their satisfactory investigation and solution depended on the general development of survey methodology. However, certain of the problems were peculiar to, or especially significant in, the field of morbidity.

The San Jose Survey was designed to investigate and develop:

1. Methods of obtaining morbidity data from population surveys based on objective sampling methods.
2. Uses of morbidity data from existing medical records.

Within the sample survey method a number of issues were investigated. These included the following:

Question yield. In many morbidity surveys the aim is to design questions which will produce a broad frame of reference regarding morbidity and which will elicit the desired information in a reasonable period of interview time. The number and types of questions to accomplish this needed to be explored.

Length of recall period. The length of time over which respondents can adequately recall illness must always be considered. The shorter the time period, the larger the sample must be to achieve a given sampling error.

Interval between end of recall period and date of interview. For a fixed recall period the length of the interviewing period influences the number of interviewers required and therefore affects survey costs.

Interviewing and diary-keeping. Interviews covering illness during a given recall period are subject to memory biases. One way of attempting to deal with memory biases is to have respondents maintain a diary. Assuming that the morbidity data obtained are otherwise satisfactory, the degree of cooperation in accepting and maintaining the diary becomes a crucial factor in any possible application of the diary method.

Continued observation of panels. To investigate the longitudinal morbidity experience of a cohort, continued observation is necessary, through periodic household visits for interviews or to place diaries. The quality of the data obtained and the extent of cooperation must be considered in assessing the feasibility of the periodic visits.

Respondent selection. When some adult members of a household are absent at the time the interviewer calls, it is economical to obtain information concerning these absent members from a proxy respondent. The savings must be balanced against biases that may result when all adults are not interviewed for themselves.

Interviewer characteristics as related to their survey performance. In morbidity surveys considerable emphasis is placed on having each interviewer follow a prescribed set of survey procedures. Given explicit procedures, it is important to determine whether differences among interviewers remain, and to determine the correlates of such differences.

Structure of the Two Surveys

A brief overview of the structure of the San Jose Survey and of the ensuing California Health Survey will serve to introduce more detailed discussions of the issues mentioned above.

SAN JOSE SURVEY. The area selected for the San Jose Survey included San Jose, a city of 95,000 people, and an adjacent rural area. Criteria used for selecting this area were: (*a*) the population of the area should be between 50,000 and 100,000; (*b*) the composition of the population should, in general, resemble that of the State as a whole; and (*c*) the area should be relatively self-sufficient in terms of medical, hospital, and related services.

In order to evaluate uses of morbidity data kept in records, morbidity information pertaining to San Jose residents was collected from hospital and physician records and from a number of agencies which routinely kept such information.

Two major household survey alternatives were investigated in the San Jose Survey: (*a*) collection of data by interviewers in a monthly interview, covering the day preceding and calendar month preceding the date of interview; and (*b*) collection of data by means of a diary maintained by the respondent daily for a month at a time. In order to compare interviews with diary-keeping and to determine the effect of repeated interviews and repeated diary-keeping, the San Jose Survey sample of about 2,400 households, containing about 6,000 persons, was split into six subsamples: groups I, II, III, IV, V, and VI. Since it was known that the level of morbidity shows seasonal variation, it was necessary to devise an experimental design which would permit comparisons between alternative household survey techniques during the same season. The plan used for interviewing and for diary-keeping is shown in figure 1 for each of the six experimental groups.

Interviews contained questions about illnesses during the preceding calendar month.

Figure 1. Schedule of interviewing and diary-keeping for experimental groups, showing month of data collection: San Jose, February–June 1952

Method	Experimental group					
	I	II	III	IV	V	VI
Initial interview	February	March	March	April	May	June.
Initial diary	March		March balance.[1]	April balance.[1]	May balance.[1]	
Repeat interview:						
First		April				
Second		May				
Third		June				
Repeat diary:						
First	April		April	May	June	
Second	May					
Third	June					

[1] Diary maintained for the balance of the month, starting with the date of interview.

Figure 2. Method of data collection for experimental groups and calendar month covered by illness questions: San Jose, January–June 1952

Calendar month covered by illness questions	Experimental group					
	I	II	III	IV	V	VI
January	Initial interview.					
February		Initial interview.	Initial interview.			
March	Initial diary	1st repeat interview.	Initial diary [1]	Initial interview.		
April	1st repeat diary.	2d repeat interview.	1st repeat diary.	Initial diary [1]	Initial interview.	
May	2d repeat diary.	3d repeat interview.		1st repeat diary.	Initial diary.[1]	Initial interview.
June	3d repeat diary.				1st repeat diary.	

[1] Diary maintained for the balance of the month, starting with the date of interview.

Interviewing started the beginning of each month, except during February, when interviewing was done at the end of the month. Figure 1 shows that group I had an initial interview and then was asked to maintain a diary for 4 months; group II had an initial interview followed by three repeat interviews; groups III, IV, and V were interviewed initially and then asked to maintain an initial diary for the balance of the interview month and a repeat diary for the following month; and group VI had an initial interview only.

The data contrasts permitted by this pattern of interviewing and diary-keeping are shown in figure 2. For the same periods of time experimental groups were reporting under several different methods. For the month of March, for example, it is possible to examine differences between initial interviews, first repeat interviews, and initial diaries.

The first interview for each household included a listing of the household members and their basic personal characteristics, morbidity information, and items to assist in obtaining morbidity data from medical records. A responsible adult member of the household served as a reporter, providing morbidity information for himself and serving as proxy respondent for related household members. (These related members are termed nonreporters.) Persons not related to the head of the household were interviewed separately. For those groups scheduled for diary maintenance, the diary was left in the household at the time of initial interview. A responsible adult household member, usually the initial interview reporter, was instructed in the use of the diary and asked to maintain it for himself and the household nonreporters for the balance of the calendar month.

CALIFORNIA HEALTH SURVEY. The California Health Survey was a statewide sample of about 10,000 households, covering approximately 30,000 persons. The sample was divided into 52 weekly subsamples, one of which was scheduled for interview during each calendar week of the survey year (May 1954–April 1955). In addition to personal characteristics, interviewers inquired about illness during the 4-week recall period preceding the week of interview and about chronic conditions. Each adult, if he was at home, was asked to report his own illnesses and chronic conditions. For adults not at home at the time the interviewer called a responsible related adult served as proxy respondent. Information about children under 18 years was supplied by a parent or other adult usually responsible for their care.

The major methodological effort of the California Health Survey was an investigation of respondent biases and of response variability in a Post Enumeration Survey (PES). The PES included a reinterview of a subsample of persons from the California Health Survey. In order to investigate respondent biases, adult nonreporters (adults having proxy respondents at original interview) were reinterviewed directly. Reinterviews also were conducted with adult reporters and with proxy respondents for children in order to examine the stability of original interview morbidity reports.

Organization of This Report

Part I of this report contains separate discussions of question yield, length of recall period, interval between end of recall period and date of interview, interviewing and diary-keeping, continued observation of panels, respondent selection, and interviewer characteristics as related to their survey performance. Part II discusses uses of medical record data. Data are based on the San Jose Survey, together with relevant methodological results from the California Health Survey.

Since most of the data contained in this report are sample estimates, they are subject to sampling errors. Appendix A contains tables of sampling errors and instructions for their use. (The "measures of sample size" appearing in many of the data tables in this report are for use in conjunction with the tables of sampling errors in appendix A.)

Definitions of certain technical terms used in this report are presented in appendix B. Appendices C, D, and E contain general background material common to several of the topics treated in the main body of the report. They include descriptions of sample designs and facsimiles of the questionnaires and forms used in the surveys.

part I

Household Survey Methods

Summarizing the discussion of Woolsey and Nisselson (7), morbidity consists of stages that may be conceptualized as forming a continuum. This continuum ranges from a hypothetical freedom from any pathological change to a state that may result in death. There are two approaches to placing a given type of morbidity along this continuum. One approach involves a direct measure of pathological change, often in terms of tissue damage or alteration in body chemistry. This approach is found in the clinical determination of disease. The second approach relates to a person's awareness of morbidity. This awareness often determines a person's actions as a result of disease.

In some types of epidemiologic studies it is necessary to measure morbidity differences between population groups by considering all cases detectable by clinical tests regardless of whether there have been subjective symptoms or awareness of morbidity. Clearly, such objectives require measurements over the scale of pathological change.

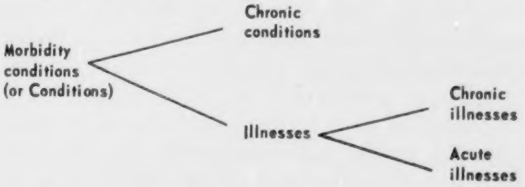
To provide measures of disease suitable for estimating the market for a prescription drug, it may be sufficient to know about cases that have reached the stage where medical care has been sought. These objectives require measurements on the scale of awareness of morbidity and, depending on the accuracy to which diagnostic information must be known, they may require measurements on the scale of pathological change as well.

These examples illustrate that either the scale of pathological change or the scale of morbidity awareness, and sometimes both scales, must be considered, depending on the uses to be made of the morbidity data. There is no single, all-purpose cutoff point.

In the discussions of household survey methods which follow, we shall be primarily concerned with the individual's awareness of morbidity. (The need for determining the relationships between pathological change and awareness of morbidity will be touched on in part II.)

For the purpose of household survey measurement, morbidity is considered basically as a departure from a state of physical or mental well-being of which the affected individual is aware. It includes not only active or progressive disease but also static chronic defects, resulting from disease, injury, or congenital malformation. The report by an individual of morbidity caused by a particular disease, injury, or impairment is called a morbidity condition, or simply a condition.

Conditions, in terms of the approach used in the San Jose and California Health Surveys, consist of two general categories: chronic conditions and illnesses. Chronic conditions consist of relatively long-term conditions (including defects or impairments) which may or may not cause illness. During the course of such a condition there may be one or more periods when the individual considers himself to be "sick" or "injured." These periods are spoken of as illnesses. Such periods, when caused by a chronic condition, are called chronic illnesses. Periods of nonchronic illness are referred to as acute illnesses. This classification may be depicted as follows:



Each type of condition described above may be classified as to relative severity in terms of the behavioral consequences of the condition. This means that actions taken by the individual as a result of the condition must be determined. For illnesses, such actions may involve the restricting of activities, including going to bed or entering a hospital, and the seeking of medical attention. Additional information may be sought about the effects of chronic conditions in terms of hospitalization, frequency of physician visits, frequency of taking medicines or treatment, and long-term limitation of activities. (Appendix B contains definitions of the morbidity terms used in this report.)

It is clear that an individual's reporting of morbidity in a household survey is contingent on a succession of events. These include: (*a*) awareness that a given condition is a departure from physical or mental well-being; (*b*) understanding the operational definitions of morbidity used in the survey; (*c*) remembering that the morbidity condition occurred or still exists; and (*d*) reporting the condition to an interviewer. The chain may be broken at any step. The following sections of part I discuss inferences that can be drawn from the survey data concerning this chain of events.

1. Question Yield at Interview

The questionnaire serves as the main means for communicating the operational definitions of morbidity to the respondent. The approaches used for questioning about illness and chronic conditions and the yield of such questioning are described separately for the San Jose Survey and the California Health Survey.

San Jose Survey

In the San Jose Survey the initial interview questions about illness and chronic conditions were the same for each of the six experimental groups. In the three repeat interviews of group II (see fig. 2) supplemental illness questions were asked after "standard" questions common to both initial and repeat interviews had been answered. We shall discuss the relative number of illnesses and chronic conditions elicited by each of the standard questions asked on all initial interviews and the increased reporting of illness and chronic conditions resulting from the supplemental questions.

THE STANDARD QUESTIONS. For each person covered by the initial interview, the standard group of illness-recall questions shown in figure 3 was asked. These started with very general questions as to whether household members had been sick or had any accidents or injuries during the recall periods covered by the interview (Q. 38–40), and included general questions about chronic conditions or impairments (Q. 43 and 44). These general questions were intended to indicate the broad frame of reference of the inquiry. Since this type of questioning might lead to underreporting of conditions not currently causing illness, it was supplemented by an inquiry, for persons reporting no illnesses, about illnesses occurring since the end of the year (Q. 41), by an inquiry covering hospitalization (Q. 42), and by a fairly extensive checklist of chronic conditions (Q. 45).

The ordering of questions was from the general to the specific. It was thought that asking more general questions first might not restrict the respondent's frame of reference as sharply as starting with specific questions. Questions having a common time reference were grouped together, and the number of different time references was kept as small as possible, consistent with other survey objectives. The questions about illness and injuries were restricted to 1-day recall (Q. 38–39) and calendar-month recall (Q. 40). The questions concerning chronic conditions (Q. 43–45) referred to the present. The inquiries about hospitalization (Q. 42) referred to the "past 12 months."

In interviewing a reporter who was acting as proxy respondent for other related members of the household, the individual questions were grouped as follows:

Question 38: Reporter first, followed by each other family member separately.

Question 39: Reporter first, followed by each other family member separately.

Question 40: Reporter first, followed by each other family member separately.

Figure 3. Standard questions: San Jose Survey[1]

38. Now I have some questions about illness yesterday. We're interested in all kinds, whether serious or not, even if they're not causing trouble right now -	(a) Was he sick in bed yesterday?	☐ Yes	☐ No
	(b) Even though he wasn't sick in bed, was he sick at all yesterday - either all day or part of the day?	☐ Yes	☐ No
	(c) Did he feel as well as usual yesterday?	☐ Yes	☐ No
39. We also want to count accidents and injuries -	(a) Did he have an accident or injury yesterday?	☐ Yes	☐ No
	(b) Did he feel any effects yesterday from an earlier accident or injury?	☐ Yes	☐ No
40. Now I want to talk about illness, accidents and injuries during the month of (____ last month)	(a) Was he sick or not feeling well at any time during (besides the ... you already told me about)?	☐ Yes	☐ No
	(b) During did he have any accidents or injuries (besides the ... you already told me about)?	☐ Yes	☐ No
	(c) Did he feel any effects during from an earlier accident or injury (besides the ... you already told me about)?	☐ Yes	☐ No
41. Ask for each person with no illness or injury reported in items 38-40 - Did he have any illness or injury at any time since December 1, 1951?		☐ Yes	☐ No
42. Now I'm going to ask you to think back over the past 12 months ______ from ______ through ______	(a) Was he in a hospital as a patient overnight or longer during any part of the past 12 months?	☐ Yes	☐ No
	(b) Ask if "No" in (a) Was he in a hospital as a patient overnight or longer at any time since January 1, 1951?	☐ Yes	☐ No
43. Does he have any chronic condition or ailment, or is there anything else wrong with him, even though it doesn't bother him all the time?		☐ Yes	☐ No
44. Does he have any impairment or handicapping condition of any kind? (Even if it doesn't interfere with his work or other usual activities?)		☐ Yes	☐ No
45. I have a card with the names of some chronic conditions and impairments. Please look over the card, and tell me whether any member of this household has any of these conditions. (Read list to respondent and enter any conditions reported.) Asthma Blindness (Complete or partial) Chronic sinus condition Chronic skin disorder Deafness (Complete or partial) Diabetes Hardening of the arteries Hay fever Heart disease Hemorrhoids Hernia High blood pressure Loss of a limb Paralysis Rheumatism or arthritis Stomach ulcers Tuberculosis Tumors Varicose veins or (Any other impairment or chronic disease or condition)		☐ Yes	☐ No

[1] Groups I-VI, initial interviews.

Question 41: Reporter first, followed by each other family member separately.[1]

Question 42: Reporter first, followed by each other family member separately.

Questions 43-44: Reporter first, followed by each other family member separately.

Question 45: All family members at one time.

As soon as a condition was reported in response to one of the questions, further information was obtained about the condition by means of three tables included on the questionnaire. One table was for illnesses (including injuries), a second for hospitalization, and a third for chronic conditions. One line of the appropriate table was filled for each condition reported, using a sequence of questions appearing in successive columns of the table. (The format of these tables appears in appendix E.)

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[1] Question 41 was asked only for persons for whom no illness or injury was reported in questions 38-40.

Considerable emphasis was placed on having each interviewer follow the prescribed sequence of questioning, asking each question exactly as worded on the questionnaire. The interviewer's training suggested additional questions to elicit further information when the respondent's answer to the original question was incomplete.

ILLNESS REPORTING. The monthly illness prevalence yield from the standard questions used on all initial interviews is shown in table 1. Illnesses reported as existing during a calendar-month recall period are distributed according to the type of question which elicited the report. The questions about illnesses "last month" accounted for more than three-quarters of the illnesses reported. Fourteen percent of the chronic illnesses were not reported until the questions about chronic conditions had been asked, and the reporter then remembered that the reported chronic condition had caused illness during the previous calendar month.

In the three repeat interviews of group II, supplemental questions were asked following the standard questions. In contrast to the standard questions which inquired directly about the occurrence of illness, the supplemental questions explored alternative approaches to gaining illness information through (*a*) a symptom approach (figs. 4 and 5) and (*b*) a medical care approach (fig. 6). In the symptom approach (Q. 61) a checklist of selected symptoms of illness and chronic conditions was read. In the medical care approach, questions were asked about activities sometimes associated with illness, the taking of medicines and treatments (Q. 57 and 58). For each person for whom no illness or chronic conditions had previously been reported, the questionnaire also contained questions about visits to medical or dental practitioners during the recall month (Q. 59 and 60).

The medical care questions and symptom list were used singly and in combination. The medical care questions were asked on the first repeat interview, both the symptom list and the medical care questions on the second repeat interview, and only the symptom list on the third repeat interview.

In table 2 the increase in the monthly prevalence of illness resulting from the supplemental questions is shown as a percentage of the monthly prevalence of illness elicited by the standard questions. On the first repeat interview the medical care questions increased the illness prevalence yield by 15 percent. On the second repeat interview the symptom list yielded an increase of 50 percent over the number of illnesses elicited by the standard questions with chronic illness showing the greatest relative increase. The medical care questions, even though they were asked after the symptom list,

Table 1. Percentage distribution of initial interview reports of monthly prevalence of illness by standard question type eliciting response, according to illness type and severity: San Jose, January–May [1] 1952

Standard question type	Total illness			Acute illness			Chronic illness		
	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.
All standard questions (Q. 38–45)	100	100	100	100	100	100	100	100	100
1-day recall (Q. 38–39)	16	17	15	12	11	13	26	30	18
Calendar-month recall (Q. 40)	76	77	74	84	85	82	57	59	54
Regarding illness (Q. 40a)	67	72	60	74	79	65	53	56	49
Regarding injury (Q. 40b)	6	4	10	9	5	15	1	1	0
Regarding effects of earlier injury (Q. 40c)	2	2	3	2	1	2	4	3	5
Recall-to-December 1, 1951 (Q. 41 [2])	3	3	3	3	3	3	3	3	3
Calendar-year hospitalization (Q. 42)	0	0	—	0	0	—	0	0	—
Chronic condition (Q. 43–45)	5	2	8	1	0	1	14	7	25
Not ascertained	0	—	0	0	—	0	0	—	0

[1] Groups I–VI, initial interviews. [2] Asked only for persons with no illness or injury reported in questions 38–40.

increased the relative yield about as much as on the first repeat interview. On the third repeat interview, the yield from the symptom list was lower (29 percent) than on the second repeat interview. For illnesses without activity restriction or medical attention, the symptom list produced a much larger percentage of gain than did the medical care questions. For the more severe illnesses the relative increases elicited by the two approaches were about the same.

Table 3 shows the yield from each type of medical care question. Questions about the taking of medicines, home remedies, and other treatments (Q. 57 a–c) and about treatment by a doctor (Q. 59a) elicited most of the additional reports of illness. Questions concerning medical care from other sources were relatively unproductive.

CHRONIC CONDITIONS. For the standard questions used in the initial interviews of all San Jose Survey experimental groups, the general questions about illness were followed by general questions about chronic conditions (Q. 43) and impairments (Q. 44), and these were followed by a list of specific chronic conditions and impairments (Q. 45). The relative proportions of chronic conditions yielded by this sequence of questions are shown in table 4.

Figure 4. Symptom questions: San Jose Survey[1]

61. (a) This month we are also interested in symptoms. I have here a card with the names of some symptoms. Please look over the card, and tell me whether any member of this household had any of these symptoms yesterday.	☐ Yes ☐ No Symptom(s):
(b) What caused the ... (symptom)?	Cause:
(c) Now, please tell me whether any member of this household had any of these symptoms last month.	☐ Yes ☐ No Symptom(s):
(d) What caused the ... (symptom)?	Cause:

[1] Group II, second and third repeat interviews.

Figure 5. Symptom checklist: San Jose Survey[1]

Abnormal bleeding from any part of the body

Convulsions or fits

Coughing

Dizziness

Earache

Fever

Headache

Indigestion

Nervousness

Night sweats

Pain in chest

Pain or swelling in joints

Paralysis, or loss of use, of any limb or other part of the body

Shortness of breath

Skin rash or sores

Swelling of ankles

Swelling or lump in any other part of the body

Trouble with bowels or urination (constipation, diarrhea, excessive urination, etc.)

Upset stomach

or

Any other special symptom

[1] Group II, second and third repeat interviews.

Questions on recent illness and hospitalization accounted for only 21 percent of the chronic conditions reported. When such questions were supplemented by the general questions on chronic conditions and impairments (Q. 43 and 44), the yield was greatly increased; an additional 47 percent of chronic conditions were reported. The final probing question (Q. 45), consisting of the list of 19 chronic conditions and impairments, accounted for a third of all the chronic conditions elicited in initial interviews. Thus, after chronic conditions causing recent illness had been recorded, questions depending on the reporter's understanding of the general terms "chronic conditions," "impairments," and "handicapping conditions" still failed to elicit reports of many chronic conditions. These remaining chronic conditions were reported in response to the checklist of specific chronic conditions.

In table 5 selected chronic conditions are listed, the categories corresponding closely to

Figure 6. Medical care questions: San Jose Survey [1]

57. Now I have a few questions about medicines and medical treatment last month.	(a) During . . . did he take any medicine or injections prescribed by a physician (besides for the ... you've already told me about)? If "Yes" - For what illness or condition did he take it?	☐ Yes ☐ No Condition(s):
	(b) During . . . did he take any other medication or home remedies (besides for the ... you've already told me about)? If "Yes" - For what illness or condition did he take it?	☐ Yes ☐ No Condition(s):
	(c) During . . . did he take any other treatment such as heat treatments, special massages, dental treatment, or the like (besides for the ... you've already told me about)? If "Yes" - For what illness or condition did he take it?	☐ Yes ☐ No Condition(s):
58. And now, I'd like to ask the same questions about yesterday.	(a) Yesterday, did he take any medicine or injections prescribed by a physician (besides for the ... you've already told me about)? If "Yes" - For what illness or condition did he take it?	☐ Yes ☐ No Condition(s):
	(b) Yesterday, did he take any other medication or home remedies (besides for the ... you've already told me about)? If "Yes" - For what illness or condition did he take it?	☐ Yes ☐ No Condition(s):
	(c) Yesterday, did he take any other treatment such as heat treatments, special massages, dental treatment, or the like (besides for the ... you've already told me about)? If "Yes" - For what illness or condition did he take it?	☐ Yes ☐ No Condition(s):
59. Ask for each person with no illness or chronic condition reported for last month.	(a) During . . . was he treated by a doctor at anytime?	☐ Yes ☐ No
	(b) During . . . was he attended by a visiting nurse?	☐ Yes ☐ No
	(c) During . . . did he make any visits to a hospital clinic or out-patient department?	☐ Yes ☐ No
	(d) During . . . was he treated by a dentist?	☐ Yes ☐ No
	(e) During . . . did he have any other medical treatment?	☐ Yes ☐ No
60. For what illness or condition was he treated?		Condition(s):

---

[1] Group II, first and second repeat interviews.

the chronic conditions named on the checklist (Q. 45). For each chronic condition the relative yield from the sequence of three different types of questions is shown: questions about recent illness, injury, and hospitalization; general questions about chronic conditions and impairments; and the chronic condition checklist. The contribution by the checklist question to the volume of chronic conditions reported varies widely. Most cases of asthma, diabetes, and stomach ulcers were reported before the checklist question was asked, whereas most cases of varicose veins and hemorrhoids were reported in response to that question.

Section 5 describes how repeat interviews, using illness questions identical with those used on initial interviews, resulted in reports of additional chronic conditions (see "Chronic Condition Reporting on Repeat Interviews" and table 40). Primarily to aid in the reporting of recent illness, the repeat interviews also contained supplemental questions covering medical care and symptoms. Like the standard questions on repeat interviews, the supplemental questions elicited reports of additional chronic conditions. The percentage of additional chronic conditions yielded by the supplemental questions in each of the repeat interview months is shown in table 6, the percentage base being the number of chronic conditions yielded by the standard questions in each repeat interview month.

California Health Survey

Since the California Health Survey, like the San Jose Survey, was intended to provide as complete a picture of the extent of illness and chronic conditions as possible, definitions of these conditions were made as broad as possible. In discussing the questions used to elicit reports of illness and chronic conditions in the California Health Survey, we shall point out the contribution of experience gained from the San Jose and other morbidity surveys.

THE QUESTIONS. The portions of the questionnaire used to elicit reports of illness and chronic conditions are reproduced in figures 7–10. General questions were asked about sickness, accidents, and injuries during the 4 weeks preceding the week of interview (Q. 8–11) and about chronic conditions or impairments (Q. 14 and 15). These general questions were supplemented by inquiries covering the taking of medicines or treatments for illness (Q. 12 and 13) and by a checklist of chronic conditions (Q. 16) and a checklist of symptoms of chronic con-

Table 2. Increase in monthly prevalence of illness resulting from supplemental questions, expressed as a percentage of monthly prevalence of illness elicited by standard questions for each month of repeat interviewing, by supplemental question type and illness type and severity: San Jose, March–May[1] 1952

(Excludes persons gained by the panel after the beginning of the survey or lost from the panel before its conclusion)

Illness type and severity	Percent of standard-question illnesses			
	First repeat interview: Medical care questions (Q. 57–59)	Second repeat interview		Third repeat interview: Symptom list (Q. 61)
		Symptom list (Q. 61)	Medical care questions (Q. 57–59)	
Total illness	15	50	19	29
With activity restriction and/or medical attendance	13	20	16	12
Without activity restriction or medical attendance	21	96	22	60
Acute illness	14	36	19	25
With activity restriction and/or medical attendance	13	14	14	9
Without activity restriction or medical attendance	16	68	27	58
Chronic illness	20	92	16	36
With activity restriction and/or medical attendance	15	37	22	18
Without activity restriction or medical attendance	32	194	6	65

[1] Group II, first, second, and third repeat interviews.

Table 3. Percentage distribution of reports of monthly prevalence of illness elicited by medical care questions at repeat interviews, by question type, according to illness type and severity: San Jose, March–April[1] 1952

(Excludes persons gained by the panel after the beginning of the survey or lost from the panel before its conclusion)

Medical care question type	Total illness			Acute illness			Chronic illness		
	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.
All medical care questions (Q. 57–59)	100	100	100	100	100	100	100	100	100
Calendar-month recall of care (Q. 57)	78	68	91	76	56	96	85	92	71
Medication prescribed by doctor (Q. 57a)	32	40	24	20	19	22	65	85	29
Other medication (Q. 57b)	31	5	62	37	7	67	15	—	43
Other treatment (Q. 57c)	15	22	6	19	30	7	5	8	—
1-day recall of care (Q. 58a–c)	5	2	9	4	4	4	10	—	29
Further calendar-month recall questions asked only for persons reporting no illness (Q. 59)	16	30	—	20	41	—	5	8	—
Treated by doctor (Q. 59a)	12	22	—	15	30	—	5	8	—
Attended by visiting nurse (Q. 59b)	—	—	—	—	—	—	—	—	—
Visited hospital clinic (Q. 59c)	1	2	—	2	4	—	—	—	—
Treated by dentist (Q. 59d)	1	2	—	2	4	—	—	—	—
Any other medical treatment (Q. 59e)	1	2	—	2	4	—	—	—	—

[1] Group II, first and second repeat interviews.

ditions (Q. 17). There was also an inquiry about hospitalization during the past 12 months (Q. 18).

Probing questions on the use of medicines, treatments, and home remedies (Q. 12 and 13) and checklists of chronic conditions and symptoms (Q. 16 and 17) were included in the California Health Survey interview because similar probes in the San Jose, Baltimore, and other health surveys had increased reports of illness and chronic conditions. The chronic condition list was expanded over that used in the San Jose Survey, and the symptom list was reduced to include symptoms of only the more severe chronic conditions.

The California Health Survey sample was randomized over 52 interview weeks, and the recall period for illness was based on the 4 weeks preceding the week of interview ("from Monday . . . through last Sunday"). Compared with the San Jose Survey method of asking during an interview month about illnesses during the preceding calendar month, this procedure tended to reduce memory loss. It was thought that the use of beginnings and ends of calendar weeks to bracket the 4-week recall period would provide convenient reference points within which to recall the occurrence of illness.

Questions regarding illness and accidents "yesterday" (the day preceding the date of interview) were not used in the California Health Survey. An experiment performed in the Baltimore Health Survey had shown that such questions did not increase the amount of illness reported for a 4-week recall period.

Table 4. Percentage distribution of initial interview reports of chronic conditions by standard question type eliciting response, according to whether medically attended: San Jose, February–June[1] 1952

Standard question type	Chronic conditions		
	Total	Medically attended	Never medically attended
All standard questions (Q. 38–45)	100	100	100
1-day and calendar-month recall of illness and injury (Q. 38–41)	17	11	36
Calendar-year hospitalization (Q. 42)	4	5	—
Chronic conditions and impairments (Q. 43–45)	79	84	62
Chronic condition question (Q. 43)	40	45	22
Impairment question (Q. 44)	7	8	3
List of specific chronic conditions (Q. 45)	32	31	37
Not ascertained	1	0	2

[1] Groups I–VI, initial interviews.

Table 5. Percentage distribution of initial interview reports of chronic conditions by standard question type eliciting response, according to diagnostic category: San Jose, February–June [1] 1952

Diagnostic category	Total chronic conditions elicited (Q. 38–45)	Illness, injury, and hospitalization questions (Q. 38–42)	Chronic condition and impairment questions (Q. 43–44)	List of specific chronic conditions (Q. 45)
All categories	100	21	47	32
Diabetes	100	22	67	11
Asthma	100	14	66	20
Ulcer of stomach and duodenum	100	31	44	25
Heart disease (excluding hypertensive heart disease)	100	26	47	27
Arteriosclerotic and degenerative heart disease	100	26	39	35
Arthritis and rheumatism	100	19	43	38
Hypertensive disease (including hypertensive heart disease)	100	23	37	40
Hernia	100	22	29	49
Hay fever	100	11	40	49
Deafness and other chronic diseases of the ear	100	5	42	53
Hemorrhoids	100	9	18	73
Varicose veins	100	4	14	82
Other diagnostic categories	100	31	53	16

[1] Groups I–VI, initial interviews.

For interviewing a person who was also responding for other related household members, the questions were grouped as follows:

Questions 8–13: Reporter first, followed by each other family member separately.

Questions 14 and 15: Reporter first, followed by each other family member separately.

Question 16: All family members at one time.

Question 17: All family members at one time.

Question 18: All family members at one time.

Questions 8–17 were asked in the prescribed order, and only a note made of conditions mentioned, before detailed questions were asked about each of the conditions reported. This procedure was a departure from the San Jose Survey, in which the interviewer stopped to fill a line in the appropriate table for each condition as it was reported. The San Jose Survey approach appeared to hinder complete reporting.

Illness Reporting. A percentage distribution of various types of illnesses prevalent during a 4-week recall period by the question type which elicited the illness report is shown in table 7. Almost all of the acute illnesses were reported in response to the questions regarding illness in the past 4 weeks. More than one-fifth of the nonrestricting acute illnesses were reported in response to the medical care questions on medicines, treatments, and home remedies (Q. 12 and 13).

More than half of the chronic illnesses were not reported in response to questions about illness in the past 4 weeks (Q. 8–13). These illnesses were reported when the reporter named a chronic condition, and then remembered, as a result of further questioning, that the condition had caused illness during the 4-week recall period. A relatively greater proportion of nonrestricting chronic illnesses (57 percent) than of activity-restricting chronic illnesses (29 percent) was elicited in this fashion.

These data again demonstrate that direct questions about illness do not produce complete reporting. Questions about behavior as-

Table 6. Increase in chronic conditions resulting from supplemental questions, expressed as a percentage of chronic conditions elicited by standard questions, in each month of repeat interviewing, by supplemental question type: San Jose, April–June [1] 1952

(Excludes persons gained by the panel after the beginning of the survey or lost from the panel before its conclusion)

Supplemental question type	Percent of each month's standard-question chronic conditions
First repeat interview:	
Medical care questions (Q. 57–59)	12
Second repeat interview:	
Symptom list (Q. 61)	123
Medical care questions (Q. 57–59)	35
Third repeat interview:	
Symptom list (Q. 61)	25

[1] Group II, first, second, and third repeat interviews.

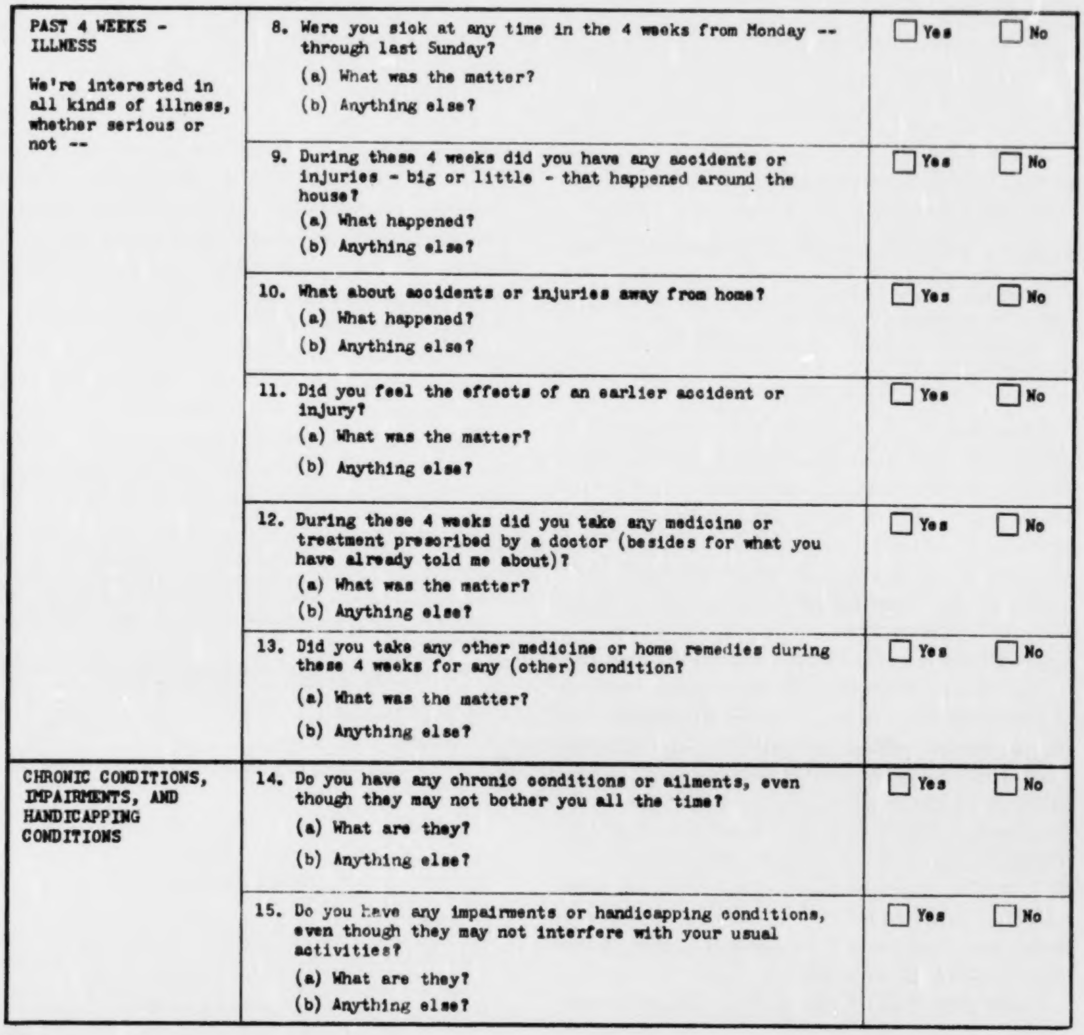
sociated with illness and about chronic conditions which may cause illness serve to increase the yield of illness reports.

Chronic Conditions. Table 8 contains a percentage distribution of chronic conditions of two severity levels by the type of question which first evoked the report of the chronic condition. As in the San Jose Survey, almost a third of the chronic conditions were not reported until the reporter was presented with a checklist of specific chronic conditions (Q. 16). Even for chronic conditions of substantial severity (causing chronic limitation of activity, or days of activity restriction in the 4-week recall period, or regular or occasional doctor visits, or hospitalization, or other days of activity restriction in the calendar-year recall period) 24 percent were not reported until the chronic condition checklist (Q. 16) was presented, and the remaining 7 percent were reported in response to the list of chronic symptoms (Q. 17).

Summary

General questions about illness and chronic conditions do not produce complete reporting. The San Jose and California Health Surveys provide evidence that reporting is increased by

Figure 7. Illness and chronic condition questions: California Health Survey



PAST 4 WEEKS - ILLNESS We're interested in all kinds of illness, whether serious or not --	8. Were you sick at any time in the 4 weeks from Monday -- through last Sunday? (a) What was the matter? (b) Anything else?	☐ Yes	☐ No
	9. During these 4 weeks did you have any accidents or injuries - big or little - that happened around the house? (a) What happened? (b) Anything else?	☐ Yes	☐ No
	10. What about accidents or injuries away from home? (a) What happened? (b) Anything else?	☐ Yes	☐ No
	11. Did you feel the effects of an earlier accident or injury? (a) What was the matter? (b) Anything else?	☐ Yes	☐ No
	12. During these 4 weeks did you take any medicine or treatment prescribed by a doctor (besides for what you have already told me about)? (a) What was the matter? (b) Anything else?	☐ Yes	☐ No
	13. Did you take any other medicine or home remedies during these 4 weeks for any (other) condition? (a) What was the matter? (b) Anything else?	☐ Yes	☐ No
CHRONIC CONDITIONS, IMPAIRMENTS, AND HANDICAPPING CONDITIONS	14. Do you have any chronic conditions or ailments, even though they may not bother you all the time? (a) What are they? (b) Anything else?	☐ Yes	☐ No
	15. Do you have any impairments or handicapping conditions, even though they may not interfere with your usual activities? (a) What are they? (b) Anything else?	☐ Yes	☐ No

Figure 8. Chronic condition list: California Health Survey

CHRONIC CONDITION LIST I would like to ask about some specific conditions --	16. Has anyone in the family had any of these conditions during the past 12 months? 1. Hay fever 2. Asthma 3. Chronic skin trouble 4. Any allergy 5. Chronic bronchitis 6. Hardening of arteries 7. High blood pressure 8. Heart trouble 9. Rheumatic fever 10. Arthritis or rheumatism 11. Varicose veins 12. Anemia 13. Stomach ulcer 14. Liver trouble 15. Gall bladder trouble 16. Kidney trouble 17. Hemorrhoids or piles 18. Neuritis 19. Cerebral palsy 20. Polio 21. Other paralysis 22. Epilepsy 23. Convulsions or spasms 24. Migraine 25. Tumor 26. Diabetes 27. Chronic sinus trouble 28. Tuberculosis 29. Hernia or rupture 30. Blindness 31. Deafness 32. Stammering or stuttering 33. Missing arm or leg 34. Handicap or defect present since birth 35. Any other chronic condition	☐ Yes ☐ No

Figure 9. Symptom list: California Health Survey

SYMPTOM LIST I would like to ask you about some particular symptoms --	17. Has anyone in the family had any of these symptoms during the past 12 months? 1. Abscessed or running ear 2. Many long-lasting or serious headaches 3. Skin rash, itching or breaking out 4. Lumps or discolored patches on the skin 5. Long-lasting pains in the chest 6. Long-lasting cough 7. Shortness of breath 8. Frequent backaches 9. Symptoms of overweight that cause trouble 10. Long-lasting pains or swelling in the joints 11. Swelling of ankles 12. Frequent diarrhea or constipation 13. Abnormal bleeding from any part of the body	☐ Yes ☐ No

Figure 10. Hospitalization question: California Health Survey

HOSPITALIZATION	18. During the past 12 months has anyone in the family been a patient in a hospital for overnight or longer?	☐ Yes ☐ No

Table 7. Percentage distribution of monthly prevalence of illness by question type eliciting response, according to severity of total illness and presence of activity restriction for acute and chronic illness: California Health Survey, April 1954–March 1955

Question type	Total illness			Acute illness			Chronic illness		
	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction	Without activity restriction	Total	With activity restriction	Without activity restriction
All questions (Q. 8–18)	100	100	100	100	100	100	100	100	100
4-week recall (Q. 8–13)	63	79	52	95	98	94	48	70	43
Regarding sickness (Q. 8)	34	56	20	62	86	44	22	54	15
Regarding injury (Q. 9–10)	6	5	7	17	7	24	1	1	0
Regarding effects of earlier injury (Q. 11)	4	3	5	2	1	2	6	5	6
Regarding medical care (Q. 12–13)	18	15	20	15	3	22	19	10	22
Chronic conditions (Q. 14–17)	36	20	47	3	1	5	52	29	57
Chronic condition question (Q. 14)	11	7	14	0	0	0	16	11	17
Impairment question (Q. 15)	4	2	5	0	0	—	5	2	6
List of specific chronic conditions (Q. 16)	14	8	18	0	0	0	20	11	23
List of specific chronic symptoms (Q. 17)	8	4	10	3	1	5	10	4	11
Calendar-year hospitalization (Q. 18)	0	0	0	0	0	0	0	0	0
Not ascertained	1	1	1	1	0	1	1	1	1

questions about action taken as a result of illness and chronic conditions, by checklists of symptoms of illness and chronic conditions, and by checklists of names of chronic conditions. One function of additional questions appears to be the provision of examples of the types of phenomena included under the terms "illness" and "chronic condition." This often enlarges the frame of reference to embrace a wider range of phenomena, many of which may not seriously affect the individual's behavior. Another function of additional questions, especially those directed to behavior associated with illness, is to remind the person of the illness or chronic condition which caused the behavior. Such behavior may often have greater saliency than does the illness which instigated it. (Another factor which may affect illness reporting, the reporter's own attitudes toward illness, was also explored in the San Jose Survey. The results, which are equivocal, are described in appendix F.) Some of the areas in which further research and experimentation would be useful are the type, ordering, and number of questions.

Evidence so far has indicated that questions which better define morbidity concepts as well as naming specific morbidity conditions increase reporting. Checklists of chronic conditions have been used in a number of surveys, but the use of checklists of illnesses has received less attention and deserves further consideration. Use of a checklist of the more common acute illnesses, for example, might lead to more complete reporting of conditions of interest. Questions about visiting doctors and the taking

Table 8. Percentage distribution of chronic conditions by question type eliciting response, according to level of severity: California Health Survey, May 1954–April 1955

Question type	Total chronic conditions	Level of severity	
		Substantial [1]	Moderate [2] or no reported effects [3]
All questions (Q. 8–18)	100	100	100
4-week recall of sickness, injury, and medical care (Q. 8–13)	30	41	16
Sickness and injury (Q. 8–11)	18	26	8
Medical care (Q. 12–13)	12	15	8
Chronic conditions and impairments (Q. 14–17)	69	58	83
Chronic condition question (Q. 14)	19	19	18
Impairment question (Q. 15)	8	7	9
List of specific chronic conditions (Q. 16)	32	24	42
List of specific chronic symptoms (Q. 17)	11	7	14
Calendar-year hospitalization (Q. 18)	0	0	0
Not ascertained	1	1	1

[1] One or more of the following factors: (*a*) causes some chronic limitation of activity, (*b*) regular or occasional doctor visits, (*c*) caused some days of activity restriction in 4-week recall period, (*d*) hospitalization or other days of activity restriction in calendar-year recall period.

[2] None of the factors in footnote 1, but one or more of the following (*e*) causes regular or occasional taking of medicine or treatment, (*f*) caused illness without activity restriction in 4-week recall period, (*g*) hospitalization prior to calendar-year recall period.

[3] None of the factors named in footnotes 1 or 2.

of medicines jog the respondent's memory about illness. It may be that questions about other actions, such as staying away from work, indoors, or in bed, would also serve as memory probes to aid in recalling the associated illness.

For illnesses and chronic conditions separately, general questions have preceded the questions about behavior associated with morbidity and the presentation of checklists. General questions have been presented first to give the respondent an opportunity to apply his own definition of morbidity before proceeding with more specific questions. There is no experimental evidence which justifies this approach.

Experience with morbidity surveys has shown that increased probing increases the yield of conditions reported. Decisions as to the maximum number of questions have been based on judgment, not on experimental results. Experimentation with a longer set of morbidity recall questions would appear to be in order.

It will be recalled that morbidity conditions were broken into two categories: chronic conditions and illnesses. Illnesses were further subdivided into acute illnesses and chronic illnesses. While dichotomizing morbidity conditions is a necessary convenience, the line of demarcation between chronic condition and illness is not distinct. Likewise, the distinction between acute illness and chronic illness is not clear cut. With advances in the conceptualization of morbidity phenomena, one would expect that categorization would be replaced first by ordinal rankings and eventually by measurement data. Such refinements in the nature of the morbidity concepts may require corresponding changes in the questionnaire and other operational procedures for measuring morbidity.

2. Length of Recall Period

The question of the length of time over which reporters can recall illness satisfactorily is important because the more limited the time period the larger the sample must be to achieve a given sampling error. On the other hand, the reporter may have difficulty remembering illnesses which occurred over a long time period. Also, he may remember an illness but have difficulty recalling its exact dates. In the present section we shall present illness rates based on recall periods of varying lengths and discuss some factors influencing recall.

One-Day Versus Calendar-Month Recall

In the San Jose Survey, respondents were asked first about illnesses "yesterday," the day preceding the date of interview, and then about illnesses "last month," the calendar month preceding the month in which interviews were conducted. In table 9 the incidence of illness and days of restricted activity and bed disability caused by illness as determined from these two time references are contrasted. Data from the initial interviews of several experimental groups are assembled so that the two types of recall periods cover the same 3-month interval, March–May 1952 (figs. 1 and 2). (The monthly rates derived from data on illness in a 1-day recall period are based on the assumption that the figures for "yesterday" represent a time sample of the month of interview. Interview days were not actually randomized over all days of the interview month, however. Nevertheless, the trend of morbidity was downward during the months March–May. Since most interviews were conducted early in those months, the monthly rates derived from 1-day recall period data probably exceed those that would have been obtained from a time sample.)

Reports of illness for the day before interview should be relatively unaffected by memory biases, compared with reports of illness for a calendar-month recall period. Table 9 indicates that monthly incidence rates based on reports of illness "yesterday" are more than four times the comparable rates for a calendar-

Table 9. Incidence of illness, days of restricted activity, and days of bed disability per 100 persons per month, by length of recall period and type of illness: San Jose, March–May [1] 1952

Length of recall period	Incidence of illness per 100 persons per month			Days per 100 persons per month						*Measure of sample size*
				Restricted activity			Bed disability			
	Total	Acute	Chronic	Total illness	Acute illness	Chronic illness	Total illness	Acute illness	Chronic illness	
1 day [2]	138	108	30	145	98	47	69	44	25	*51*
Calendar month	29	21	8	109	62	47	54	29	25	*50*

[1] 1-day recall data from groups III–V, initial interviews. Calendar-month recall data from groups IV–VI, initial interviews.

[2] Since data apply to "yesterday," the day preceding the day of interview, they are adjusted to a whole-month basis on the assumption that they represent morbidity for the entire month. The trend of morbidity was downward during the months March–May, and most interviews were conducted early in those months, so the rates shown here probably exceed the rates that would have been obtained if a subsample had been interviewed on each day of the months of interview.

month recall period, for both acute and chronic illnesses. Although the difference between these two sets of figures undoubtedly represents memory loss for reports applying to "last month," it is likely that some of the illnesses reported as starting "yesterday" may be overreports. Since the questions about illness "yesterday" occurred early in the interview and preceded the questions about illness "last month," the reporter may have been overly obliging in responding to questions about illness yesterday. Also, some reports of illness "yesterday" may lack the time perspective needed to decide whether the event was really an illness and whether it started on the date named.

One would expect that illness that affected the person's behavior would be less subject to memory biases. Table 9 contains some measures of the effect of illness on behavior; namely, days of restricted activity and days of bed disability. For days of restricted activity (which include bed-disability days), the prevalence rates derived from illness reported for the 1-day recall period are about 40 percent higher than the rates derived from illnesses reported for the preceding calendar month. However, the difference comes from differences in acute illness days; the rates for chronic illness days are about the same. A similar differential holds for days of bed disability alone. The relative differences in the prevalence rates derived for 1-day recall reports suggest that days of restricted activity caused by chronic illness may be less subject to memory bias than are days of restricted activity caused by more transitory acute conditions. The person still has the chronic condition to serve as a memory aid.

It is apparent, then, that illness levels reported at interview for the preceding calendar month are much lower than reports of illness covering 1 day of recall.

Factors Affecting Recall

One of the experimental groups in the San Jose Survey was scheduled for repeated interviewing at monthly intervals. In a given month of interviewing, reporters were asked

Table 10. Percentage of agreement on comparing illnesses with and without activity restriction for 1-day recall periods with illnesses for calendar-month recall periods covering the same days: San Jose, March–May [1] 1952

(Includes only those 1-day recall period illnesses for which the same reporter responded for the calendar month covering those days. Excludes responses to supplemental questions 57–59 and 61. See section I)

Results of matching [2]	1-day recall period illness		
	Total	With activity restriction	Without activity restriction
Total illness for 1-day recall period [3]	100	100	100
Matching illness reported in calendar-month recall period	32	43	26
No matching illness reported in calendar-month recall period	68	57	74
One or more other illnesses [4]	20	17	21
No illness reported	48	39	52
Measure of sample size	*4.1*	*1.4*	*2.7*

[1] 1-day recall period data from group II, initial, first, and second repeat interviews. Corresponding calendar-month recall data from group II, first, second, and third repeat interviews respectively.

[2] Reports of illness for 1-day and calendar-month recall periods were considered to match if both referred to the nature of the illness in similar terms and if the reports agreed on two of the following three criteria: (*a*) presence or absence of activity restriction, (*b*) whether or not medically attended, (*c*) interval between reported dates of onset not greater than 7 days.

[3] Data apply to "yesterday," the day preceding the day of interview. Since illnesses "yesterday" reported on the first day of the interview month refer to the last day of the preceding month, they are excluded.

[4] Includes 1 percent which would have been matched by calendar-month recall period illness elicited by supplemental questions 57–59 and 61.

about illness "yesterday," the day preceding the day of interview. When the reporter was interviewed the following month, reports of illness for the preceding calendar month should have included the illnesses that were reported as occurring "yesterday" in the preceding month's interview. This provides an opportunity to check completeness of reporting of some illnesses for the calendar-month recall period.

In table 10 reports of illness for 1-day recall periods are distributed according to whether or not they matched with subsequent reports of illness for the calendar-month recall period. Using a rather stringent definition of a "match" (table 10, footnote 2), only 32 percent of all illnesses "yesterday" matched an illness reported in the calendar month. The proportion of matches was somewhat higher for activity-restricting illnesses "yesterday" (43 percent) than for nonrestricting illness "yesterday" (26 percent). For 48 percent of the persons reported ill "yesterday" there was no subsequent report of illness for the calendar-month recall period in which "yesterday" occurred. These findings suggest a high volume of memory loss for the calendar-month recall period. They also suggest that some illness "yesterday" may be overreported or that an event considered as illness in the immediate past may no longer be perceived as illness when viewed over a longer recall period.

If forgetting of illness is a factor in accounting for the differences between levels of illness reporting for a 1-day and 1-month recall period, one would expect that respondents would recall fewer illnesses as starting in those weeks

Table 11. Incidence of illness per 100 persons per week in the calendar-month recall period, expressed as a ratio to the rate for the last week in the calendar-month recall period, for interviews and diaries, by illness type and severity: San Jose, March–May [1] 1952

(Excludes persons gained by the panels after the beginning of the survey or lost from the panels before its conclusion)

Illness type and severity	Incidence of illness in last week (week 1)	Number of weeks prior to end of recall period				
		1	2	3	4	More than 4 [2]
		Ratio to the last week (week 1)				
INITIAL INTERVIEWS						
Total illness	7.2	1.00	0.71	0.93	0.66	1.80
With activity restriction and/or medical attendance	3.9	1.00	.72	.99	.94	2.14
Without activity restriction or medical attendance	3.3	1.00	.70	.86	.31	1.40
Acute illness	5.3	1.00	.78	.98	.62	1.40
With activity restriction and/or medical attendance	3.1	1.00	.72	.99	.84	1.79
Without activity restriction or medical attendance	2.2	1.00	.86	.96	.31	.85
Chronic illness	1.8	1.00	.50	.81	.78	2.94
With activity restriction and/or medical attendance	.8	1.00	.69	1.00	1.35	3.33
Without activity restriction or medical attendance	1.0	1.00	.34	.66	.31	2.62
DIARIES						
Total illness	10.2	1.00	1.22	1.27	1.23	---
With activity restriction and/or medical attendance	5.2	1.00	1.20	1.24	1.23	---
Without activity restriction or medical attendance	4.9	1.00	1.24	1.30	1.22	---
Acute illness	8.3	1.00	1.18	1.26	1.24	---
With activity restriction and/or medical attendance	4.2	1.00	1.16	1.22	1.27	---
Without activity restriction or medical attendance	4.0	1.00	1.20	1.30	1.20	---
Chronic illness	1.9	1.00	1.41	1.30	1.16	---
With activity restriction and/or medical attendance	1.0	1.00	1.38	1.34	1.00	---
Without activity restriction or medical attendance	.9	1.00	1.44	1.26	1.33	---
Measure of sample size:						
Initial interviews	*49*					
Diaries	*47*					

[1] Groups IV–VI, initial interviews; group I, initial diaries; groups III and IV, first repeat diaries.

[2] Illnesses reported as starting on the first days of the month which were more than 28 days from the end of the month. There was an average of 2.67 such days in the March-May period. The rates on which the ratios are based were adjusted to a full-week basis.

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Table 12.—Incidence of illness per 100 persons per week in the 4-week recall period, expressed as a ratio to the rate for the last week in the recall period, by illness type and severity: California Health Survey, April 1954–March 1955

(Excludes persons for whom interviews were obtained [illegible])

Illness type and severity	Incidence of illness in 1st week (rate)	Number of weeks prior to end of recall period			
		1	2	3	4
		Ratio of incidence rates [illegible]			
Total illness	17.5	1.00	0.60	0.41	0.33
With activity restriction and/or medical attendance	[illegible]	1.00	.86	.63	.66
Without activity restriction or medical attendance	11.8	1.00	.48	.29	.26
Acute illness	9.1	1.00	.69	.49	.42
With activity restriction and/or medical attendance	3.5	1.00	.95	.70	.70
Without activity restriction or medical attendance	5.6	1.00	.53	.32	.24
Chronic illness	8.7	1.00	.51	.34	.37
With activity restriction and/or medical attendance	2.5	1.00	.73	.57	.60
Without activity restriction or medical attendance	6.2	1.00	.43	.31	.28
Measure of sample size	91				

in the calendar-month recall period which were more distant in time from the day of interview. In table 11, for three San Jose Survey initial interview groups, the incidence of illness is tabulated according to the week of the calendar month in which the illness started. Incidence rates for groups maintaining diaries during comparable months are presented as a standard with which to compare the initial interview rates. (As diary maintenance was requested on a daily basis, there should be no marked differences in diary-recorded incidence rates among the weeks of the calendar month.) Since the last week in the calendar-month recall period is closest to the date of interview, recall should be best for that week. In table 11 the incidence rates for each week in the calendar-month recall period for various categories of illness are expressed as a ratio of the rate for the last week in the calendar month. For the diary groups these ratios for all types of illness are about constant in the second, third, and fourth week prior to the end of the diary-keeping month.

The ratios for the interview groups for illnesses which were neither activity restricting nor medically attended are lower in the second, third, and fourth weeks than in the first week prior to the end of the recall period. The ratios for the third week are generally higher than for the second or fourth week, while the ratios for more than 4 weeks (the first days in the month) are generally the highest of all. The higher ratios for the third week may be attributable to the fact that the 15th day of the months in question fell in the third week. When asked to recall the exact starting date of an illness which they thought occurred about the middle of the month, household reporters may have selected the 15th day of the month. The higher ratios for the first days in the month may have been caused by reporters assigning illnesses they remembered as occurring in the early part of the month to the first days of the month, and by overreporting illnesses that actually started toward the close of the previous month.

If there were no problems in recall at interview, the starting dates of illness should be distributed about equally over the month. These San Jose data suggest that both forgetting and displacement of dates of onset occur.

It was possible to do a similar analysis with data from the California Health Survey, where

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Since the ratios for the second through fourth weeks exceed 1.00, one can conjecture that the decreased reporting in the first week prior to the end of the recall period was caused by failure to maintain diaries on a daily basis (see section 4, "Diary-Keeping Compared With Interviewing," "Cooperation in diary-keeping") or by waiting to evaluate the seriousness and nature of an illness before entering it in the diary.

Table 13. Percentage of agreement in month of hospital admission on comparing matched records of hospitalized illness from the survey and from hospitals: San Jose, July 1951–May[1] 1952

(Excludes persons living outside the San Jose City limits)

Results of comparison	Percent
[illegible]	100
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible] than 1 mo[illegible]	5
Number of records compared	*263*

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[1] Groups I–VI, initial interviews. Check period varied from 7 to 11 months for the various groups in the sample.

NOTE: Data adapted from footnote 17 of Belloc (*8*).

improved recall should have resulted from a shortening of the interval between the end of the recall period and the interview date. (In the California Health Survey, respondents were asked about illnesses in the 4 calendar weeks prior to the week of interview.) Table 12 shows the incidence of illness according to the number of weeks elapsing between the week of onset and the end of the recall period. As in table 11, the incidence rates for each week are expressed as a ratio to the rate for the last week in the 4-week period, the week immediately prior to the interview week. In general, the ratios decline as the number of weeks prior to the end of the recall period increases. These data appear more regular than the comparable data from the San Jose Survey. The use of a 4-week recall period preceding the week of interview in the California Health Survey probably enabled persons to remember whether or not illnesses occurred within the 4-week period and to assign dates of onset m[illegible] accurately. Table 12 indicates that in the California Health Survey recall was better for acute illnesses than for illnesses caused by a chronic condition, and that it was better for activity-restricting or medically attended illnesses than for illnesses involving neither restriction nor medical attendanc[illegible]

In the preceding paragraphs one must assume that recall of dates of onset is accurate if one wishes to interpret the illness ratios as indicating pure rates of "forgetting." Some direct [illegible] of hospitalized illness is available [illegible] [illegible] ization during the year preceding the mont[illegible] interview. For each period of hospitalization reported, the respondent was asked the month of admission to the hospital. For those cases in which the survey report of hospitalization matched the report in the hospital records, it was possible to compare the dates of admission indicated in the two sources. As shown in table 13, in 4 percent of the matched reports of hospitalization, the survey report was earlier than the admission date indicated in the hospital record, while in 16 percent the survey report was later than that shown in the hospital record. In general, then, there appeared to be a tendency to report an appreciable proportion of hospitalized illnesses as occurring in a more recent time period than the correct one. It is likely that this tendency occurs for less serious illnesses as well.

Summary

The relative volume of illness reported at interview declines as the length of the recall period increases. This effect varies according to the relative severity of the illness. Both forgetting and displacement of onset dates become more pronounced as the period of recall increases. Even if memory were infallible, the altered frame of reference accompanying a longer recall period might lead to reduced levels of illness reporting.

3. Interval Between End of Recall Period and Date of Interview

In morbidity surveys the illness recall period is often defined in terms of one or more calendar weeks or calendar months to promote ease of recall and to obtain a sample of morbidity experience during defined periods of time. Given such specified recall periods, consideration must be given to the length of time after that recall period over which interviewing can take place. If the interval between the end of the recall period and the date of the interview must be short, more interviewers are needed than would be the case for a longer interviewing period.

In the San Jose Survey, interviewing took place throughout the month following a given calendar-month recall period. Most interviews were conducted fairly early in the month of interview. A percentage distribution of persons according to the interval between the end of the calendar-month recall period and their interview date is shown in table 14. Although interview dates were not randomized over the interview month, it is still of interest to compare levels of illness for interviews conducted shortly after the end of the recall period with illness levels for interviews conducted later in the interview month. For this purpose we shall consider illness data from the initial interviews of three of the San Jose Survey experimental groups.

For the initial interview of groups IV, V, and VI, almost three-quarters of the persons were interviewed within 1 week following the end of the calendar-month recall period, and most of the remaining persons were interviewed during the second week following the end of the calendar month of recall.

In table 15 the monthly incidence rates obtained in each week of initial interviewing are expressed as a ratio of the rates obtained in the first week of the interview month. As the interval between the end of the recall period and the week of interview increases, the incidence of illness declines. In particular, the incidence rate for acute illness reported more than 2 weeks from the end of the recall period is less than half that reported in the first week of interview.

One might account for these results by con-

Table 14. Percentage distribution of persons by interval between end of calendar-month recall period and interview date, according to interview group: San Jose, February–June 1952

Interview group	Total	Number of weeks between end of calendar-month recall period and interview date					*Measure of sample size*
		1 or less	1-2	2-3	More than 3	Not ascertained	
I: Initial interview	100	—	—	9	91	—	*17*
II:							
Initial interview	100	41	37	11	9	2	*15*
First repeat interview	100	1	78	18	4	—	*15*
Second repeat interview	100	60	33	2	2	3	*15*
Third repeat interview	100	71	18	5	2	5	*15*
III: Initial interview	100	41	40	15	3	0	*17*
IV: Initial interview	100	84	10	3	2	—	*18*
V: Initial interview	100	76	19	5	1	—	*16*
VI: Initial interview	100	61	34	4	1	—	*16*
IV–VI: Initial interviews	100	74	21	4	1	—	*50*
II: All repeat interviews	100	43	44	8	3	3	*46*

Table 15. Incidence of illness per 100 persons per month by illness type and severity, and percentage of persons ill on day before interview by illness type, according to interval between end of calendar-month recall period and initial interview date, expressed as a ratio to the rate for initial interviews conducted in the first week of the interview month: San Jose, March–May [1] 1952

Illness type and severity	Illness rate		Number of weeks between end of calendar-month recall period and interview date		
	All weeks	First week	1 or less	1–2	More than 2
			Ratio [2] to first week		
	Incidence of illness per 100 persons per month				
Total illness	29	32	1.00	0.86	0.51
With activity restriction and/or medical attendance	18	19	1.00	.94	.64
Without activity restriction or medical attendance	11	13	1.00	.75	.32
Acute illness	21	23	1.00	.90	.39
With activity restriction and/or medical attendance	13	14	1.00	.96	.39
Without activity restriction or medical attendance	8	9	1.00	.81	.40
Chronic illness	8	9	1.00	.74	.83
With activity restriction and/or medical attendance	4	5	1.00	.85	1.40
Without activity restriction or medical attendance	3	4	1.00	.62	.15
	Percent of persons ill on day before interview				
All persons	13	14	1.00	0.88	0.81
With acute illness	9	9	1.00	.85	.89
With chronic illness	5	5	1.00	.96	.67
Measure of sample size	50				

[1] Groups IV–VI, initial interviews. [2] Ratios were computed before the illness rates were rounded.

jecturing that persons covered by interviews in later weeks were healthier. If one considers rates of illness "yesterday" (the day preceding the day of interview) as an index of "healthiness," this conjecture seems partly true. Rates of persons ill on the day before interview, shown in table 15, also decline as the interval between the end of the recall period and the interview date increases. However, the rate of decrease for persons ill on the day before interview is not as great as that for monthly incidence of acute illness. (Some of the persons for whom interviews were obtained within a week of the end of the calendar-month recall period may have been found at home early because they were ill.)

It is likely that the decline in rates of incidence of acute illness as the interval between the interview and the end of the recall period increases reflects difficulties in recall. In order to reduce this effect, California Health Survey interviews were scheduled to take place in the week following the end of a given 4-week recall period. For interviews which were completed later than the scheduled interview week, the period of recall was changed so that it covered the 4 calendar weeks preceding the actual week of interview.

4. Interviewing and Diary-Keeping

Persons tend to forget about illnesses as time goes by. Forgetting and other recall problems place definite restrictions on the illness data that can be collected in an interview survey. A diary maintained each day is a possible means for dealing with recall problems. Among factors to be considered in evaluating diary-keeping are the extent of cooperation and its relative cost.

This section contains some of the results from a San Jose Survey experiment comparing initial interviewing with initial diary-keeping. Results from the San Jose Survey experience based on different illness measures from those used in this report have been reported by Allen, Breslow, Weissman, and Nisselson (*9*). This section also describes results from a California Health Survey experiment in which a modified diary or "health calendar" was used as an aid to illness reporting at interview.

Diary-Keeping Compared With Interviewing

THE EXPERIMENT. The design of the San Jose Survey permitted comparison of experimental groups, each of whose initial interviews covered a given calendar-month recall period, with experimental groups maintaining initial diaries during the same calendar month (see fig. 2).

The initial interview questionnaire asked about illness "yesterday," the day preceding the day of interview. Questions about illness "last month," the calendar month preceding the month of interview, and questions about chronic conditions followed. For each illness and chronic condition reported, the interviewer asked a set of questions designed to obtain further information about the condition, including medical attendance and the amount of activity restriction, if any. An adult respondent reported morbidity information for himself and for other related household members.

The initial diary booklet, shown in appendix E, was left with the household reporter at the time of the initial interview. The booklet contained a page for each person in the household, with a space for entries for each day in the month. The questions printed on the diary form corresponded closely to those asked at initial interview for "yesterday" (the day

Table 16. Percentage distribution of persons eligible for initial diaries by reason for not keeping diaries, and percentage distribution of persons providing data in initial diary groups by method of obtaining information: San Jose, March–May [1] 1952

Reason for not keeping diaries	Persons covered at initial interviews	Method of obtaining information	Initial diary groups—persons providing data
All persons eligible for initial diaries	100		
Persons providing data	95	Persons providing data	100
		Diaries maintained	95
		Repeat interview requested by reporter in lieu of diary	3
Losses from eligible group	5		
Refused to maintain diary	3		
Moved during diary-keeping period	2		
Died during diary-keeping period	—		
		Initial interviews for persons "gained" [2]	2
Measure of sample size	*68*	*Measure of sample size*	*66*

[1] Groups I, III-V.

[2] Persons moving into households during the month scheduled for initial diary-keeping were given initial interviews.

preceding the day of interview). The interviewer instructed an adult household member in the use of the diary, which the reporter was to maintain daily for each related household member. Similar instructions appeared inside the booklet itself. The interviewer left a franked envelope for returning the completed booklet to the local office of the Bureau of the Census on the first of the following month.

COOPERATION IN DIARY-KEEPING. During the months for which initial diaries were scheduled to be kept there were changes in the composition of the experimental groups. Losses to the groups initially interviewed are presented in the left half of table 16. Of the persons covered at initial interview, 5 percent did not provide information during the month they were scheduled to keep an initial diary because of refusals or moving out of the household. This loss was partially offset by a 2 percent gain from persons moving into the households. These persons were given initial interviews.[3]

The initial diary group, after these gains and losses, consists of all persons for whom information was obtained for the months for which initial diary-keeping was scheduled. In some cases the household reporter at initial interview was unwilling to maintain an initial diary for himself and other related household members, but consented to provide a repeat interview covering the month for which initial diaries were scheduled to be kept. As indicated in the right half of table 16, interview data in lieu of diary information were obtained for a relatively small proportion (3 percent) of the persons in the initial diary group.

Thus, the great majority remaining in the panel were willing to keep initial diaries. Evidence on how well diaries were kept is available from a special study of one of the San Jose Survey experimental groups. In this group an interviewer called at least once during the month of initial diary-keeping to review the diary for completeness of recording and accuracy of illness descriptions. The household reporter made entries for 88 percent of the diary days, although not necessarily on a daily basis (table 29). For the remaining 12 percent of the diary days (many of which may have been days with no illness) the interviewer filled in the needed information. About a third of the diaries failed edit and had to be followed up because of one or more inadequate entries, mainly inadequate descriptions of morbidity conditions. (The standard used for judging the adequacy of condition descriptions was somewhat more rigorous than that contained in the instructions to the household reporter.) Thirty-eight percent of the diaries were mailed in within 5 days of the close of the month; telephone reminders brought in an additional 46 percent, and the remaining 16 percent were obtained on an interviewer's visit to the household. (These latter data are based on the first repeat diary of group I, but are roughly applicable to initial diaries as well. See section 5, "Assistance Visits to Diary Keepers" and table 32.)

ILLNESS REPORTING ON INITIAL INTERVIEWS AND INITIAL DIARIES. Initial interviews in the San Jose Survey covered illnesses on the day preceding the date of interview as well as during the previous calendar month. Initial diaries were kept for the balance of the month following the date of initial interview. Data from these two sources can be used to compute a series of monthly illness rates based on three types of reporting situations: a 1-day recall period at initial interview, a part-month covered by an initial diary, and a calendar-month recall period at initial interview.

In table 17 some monthly illness rates derived from each of the three reporting situations are contrasted. Data from the experimental groups were selected so that each of the three types of reporting situations refers to the same period of the year (March–May 1952). Therefore, significant differences between the rates in table 17 reflect survey procedures rather than seasonal influences. Illness rates in this portion of the report are based only on persons who remained in a given experimental group throughout the scheduled survey period.

For most of the illness measures treated in

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[3] For the four groups scheduled to maintain initial diaries, dwelling units determined to be vacant at the initial call were dropped from the sample. Persons remained in the survey only so long as they continued to be residents of the dwelling units selected in the sample; persons moving from these households represented losses. Gains include movements only into households which were occupied at the time of the initial interview.

Table 17. Incidence of illness, days of illness without restricted activity, days of restricted activity, and days of bed disability, per 100 persons per month, by illness type and severity, for 1-day and calendar-month recall periods on initial interviews and for initial diaries: San Jose, March–May [1] 1952

(Excludes persons gained by the panels after the beginning of the survey or lost from the panels before its conclusion)

Illness type and severity	1-day recall period: [2] Initial interviews	Initial diary groups [3]	Calendar-month recall period: Initial interviews
	Incidence of illness [4] per 100 persons per month		
Total illness	140	60	29
With activity restriction and/or medical attendance	. . .	29	18
Without activity restriction or medical attendance	. . .	31	11
With activity restriction	27	24	14
Without activity restriction	113	36	15
Acute illness	110	47	21
With activity restriction and/or medical attendance	. . .	23	13
Without activity restriction or medical attendance	. . .	24	8
With activity restriction	21	20	11
Without activity restriction	89	27	10
Chronic illness	30	13	8
With activity restriction and/or medical attendance	. . .	6	4
Without activity restriction or medical attendance	. . .	7	3
With activity restriction	6	4	3
Without activity restriction	24	9	5
	Days of illness without restricted activity per 100 persons per month		
Total illness	343	169	---
Acute illness	237	110	---
Chronic illness	106	59	---
	Days of restricted activity per 100 persons per month		
Total illness	141	112	109
Acute illness	97	82	63
Chronic illness	44	31	47
	Days of bed disability per 100 persons per month		
Total illness	66	45	54
Acute illness	44	30	29
Chronic illness	22	14	25
Measure of sample size	*49*	*48*	*49*

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[1] 1-day recall period data from groups III–V, initial interviews. Initial diary data from groups III–V. Calendar-month recall period data from groups IV–VI, intitial interviews.

[2] Since data apply to "yesterday," the day preceding the day of interview, they are adjusted to a whole-month basis on the assumption that they represent morbidity for the entire month. The trend of morbidity was downward during the months March–May, and most interviews were conducted early in those months, so the rates shown here probably exceed the rates that would have been obtained if a subsample had been interviewed on each day of the months of interview.

[3] Includes about 2 percent of persons for whom the household reporter was unwilling to keep a diary, but for whom he consented to provide a repeat interview instead.

Since initial diaries covered only that portion of a month remaining after interview, it was necessary to adjust rates to a whole-month basis, on the assumption that illness reported in the later part of the month was representative of the entire month. The trend of illness was downward during the months March-May, so the adjusted rates are probably an underestimate of the rates that would have been obtained had the initial diaries been kept for a whole month.

[4] 1-day recall period data regarding medical attendance are not analogous with calendar-month data, since there is a lower probability that a person will have seen a doctor within 1 day of the start of an illness than when reporting covers a calendar month. Data involving restricted activity, also, would be influenced by this factor, but not as greatly.

table 17, monthly illness rates derived from a 1-day recall period at initial interview are about twice as high as comparable rates from initial diaries. In turn, the initial diary rates exceed those covering a calendar-month recall period at initial interview. The differences are most marked for illnesses having no behavioral consequences, such as activity restriction or medical attendance.

For each of the illness measures considered, the differences among acute illness rates in the three reporting situations are of about the same relative order of magnitude as are the chronic illness rate differences.

Factors Affecting Illness Reporting. Characteristics of both the diary method and the interview questions about 1-day recall of illness may have widened the differences between monthly illness rates obtained from these two reporting situations. As the initial diary rates are lower than comparable rates derived from 1-day recall questions, it would appear that diary-keeping does not produce complete reporting, particularly of minor illnesses causing no activity restriction. Such incomplete reporting could reflect the fact that not all diaries were maintained assiduously on a daily basis. In the interview situation, questions about illness "yesterday" preceded all other illness questions. When responding to questions about illness "yesterday," some household reporters may have included illness which actually occurred at an earlier time. Some may have applied to questions about "yesterday" a broader conception of illness than when reporting illnesses "last month." Some overreporting of illness "yesterday" at initial interview is suggested by the fact that illness rates from 1-day recall periods at repeat interviews are lower than at comparable initial interviews (table 33). Also see the discussion of table 19.

Now let us consider factors associated with lower illness rates on initial interviews covering a calendar-month recall period than on initial diaries. The lower rate at initial interview results in part from memory biases, attributable to the length of the recall period (section 2), the interval between the end of the recall period and the interview date (section 3), and the failure to use sufficient probing questions about illness in the calendar-month recall period (section 1). The California Health Survey of 1954–55 used more illness-probing questions, a relatively short time interval between the end of a 4-week recall period and the interview date, and other features designed to improve illness recall. San Jose Survey illness incidence rates for initial interviews and initial diaries for March–May 1952 and California Health Survey incidence rates covering parallel months are presented in table 18. The California Survey rates approach the San Jose Survey initial diary rates, primarily because of a high level of reporting of illnesses causing neither activity restriction nor medical attendance. Although the geographic areas and years are not the same, it is likely that improved procedures in the California Health Survey increased the levels of reporting of these less severe illnesses. Thus, improved interviewing procedures appear to produce illness rates approaching those obtainable from diaries.

Finally, let us consider whether a modification in the analysis of illness data from the diary might lead to rates closer to those of initial interview. In the San Jose Survey illnesses were defined as beginning or ending on the dates recorded in the forms used. Under this practice, successive reports of sickness separated by an interval of only 1 "well" day were each counted as separated illnesses. Inspec-

Table 18. Incidence of illness per 100 persons per month, comparing initial interviews and initial diaries from the San Jose Survey and California Health Survey interviews covering parallel recall periods, by severity of illness: San Jose, March-May 1952; California Health Survey, April-May 1954, March 1955[1]

Severity of illness	San Jose Survey		California Health Survey: Interviews[2]
	Initial interview groups	Initial diary groups	
Total illness[3]	29	58	50
With activity restriction and/or medical attendance	18	28	22
Without activity restriction or medical attendance	11	30	28
Measure of sample size	*50*	*50*	*21*

[1] San Jose Survey initial interview data from groups IV–VI. Initial diary data from groups III–V. California Health Survey data from interviews scheduled for weeks 1–7 and 47–52.

[2] Excludes 6.3 percent of persons for whom interviews were obtained 1 or more weeks later than the scheduled week.

[3] Since the definitions of acute and chronic illness were not comparable in the two surveys, contrasts by type of illness are not included in this table.

tion of some diaries suggested that 1- or 2-day intervals between illnesses were much more frequent in the diary reports than in the interview reports. It was conceivable that the broadened perspective afforded by a longer recall period might lead to reappraisal and [illegible]

[illegible] incidence rates [illegible] periods of "related" illnesses. (Illnesses were considered to be "related" when the first commonly precedes the second or when the reporter stated that the illnesses were related.) The consequences of this consolidation for initial interviews and initial diaries are shown in table 19. After consolidating periods of related sickness separated by "well" periods of 1, 1–2, 1–3, or 1–6 days, the incidence rates of illness on initial diaries decreased 3, 6, 9, and 15 percent respectively. There were no "related" illnesses reported on initial interviews. Even after consolidation of related diary illnesses separated by "well" periods of 1–6 days, the level of acute illness reported in the diary remains substantially higher than that reported in the interview, with the differential being particularly marked for nonrestricting, nonmedically attended acute illness.

Thus, diaries kept for a month produced [illegible]

[illegible] substantial [illegible]

Diary-Keeping as an Aid to Interviewing

The Experiment. In the California Health Survey it was decided to see if the accuracy of illness information at interview could be improved by having a day-by-day illness record kept for a 4-week period. During the last 12 weeks of the survey, the sample of mailable addresses was divided into two subsamples: the interview-only group and the calendar-interview group. The interview-only group was interviewed in the regular manner. For the calendar-interview group, a blank

Table 19. Incidence of illness per 100 persons per month when periods of "related" illnesses are consolidated, according to number of days with no illness separating the periods, by illness type and severity, for initial diaries and initial interviews: San Jose, March[1] 1952

Item	Total illness			Acute illness			Chronic illness			*Measure of sample size*
	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	
Initial diary[2] illness:										
Separated by a period of one or more "well" days	66	34	31	55	30	25	10	4	6	*16*
After consolidating periods of "related"[3] illnesses separated by intervals of—										
1 "well" day	64	34	30	54	30	24	10	4	6	*16*
1–2 "well" days	62	33	29	52	29	24	10	4	5	*16*
1–3 "well" days	60	33	28	51	28	23	9	4	5	*16*
1–6 "well" days	56	31	25	48	27	21	8	4	4	*16*
Initial interview illness:										
Separated by a period of one or more "well" days	34	23	11	25	17	8	9	5	4	*18*
After consolidating periods of "related"[3] illnesses separated by intervals of 1–6 "well" days[4]	34	23	11	25	17	8	9	5	4	*18*

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[1] Initial diary data from group III. Initial interview data from group IV.

[2] Includes about 1 percent of persons for whom the household reporter was unwilling to keep a diary but for whom he consented to provide a repeat interview instead.

Since initial diaries covered only that portion of a month remaining after interview, it was necessary to adjust rates to a whole-month basis, on the assumption that illness reported in the later part of the month was representative of the entire month. The trend of illness was downward during the month of March, so the adjusted rates are probably an underestimate of the rates that would have been obtained had the initial diaries been kept for a whole month.

[3] Illnesses were considered to be "related" in those cases where the first commonly precedes the second or when the respondent stated that they were associated. For example, "unusually tired" was consolidated with "cold"; "asthma" and "sinus trouble due to asthma" were consolidated.

[4] When the criteria described in footnote 3 were applied, no interview-reported illness could be consolidated.

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Table 20. Percentage distribution of persons eligible for interview by reason for no interview, for calendar-interview group and interview-only group: California Health Survey, February–April 1955

(Excludes persons in dwelling units for which a complete mailing address was not available at the time the health calendar was sent)

Reason for no interview	Calendar-interview group	Interview-only group
All eligible persons	100	100
Completed interview	97	96
No interview	3	4
Not at home after 3 or more calls	1	1
Temporarily absent	0	1
Refusal	1	2
Other reasons	1	0
Measure of sample size	[illegible]	[illegible]

health calendar form and letter about the California Health Survey were mailed to each household about a week before the start of the 4-week recall period for which the household would be interviewed. The letter asked that a record of the family's health be kept on the health calendar each day for a specified 4-week period. The letter also explained that the interviewer would ask for the calendar when she called to interview the household concerning illness in the 4-week recall period.

COOPERATION IN MAINTENANCE OF HEALTH CALENDAR. The advance request to maintain a health calendar apparently did not affect willingness to be interviewed. Comparing the calendar and noncalendar groups, there was no significant difference in the proportion of persons not interviewed (table 20). Cooperation in maintaining the health calendar was far from complete, however (table 21). Only 17 percent of the households in the calendar-interview group made the requested daily entries, and only another 14 percent made some entries on the calendar form. Forty-three percent of the households had received the health calendar but made no entries. The respondents in the remaining 25 percent of the households said that the calendar had not been received. Thus, only one-third of the households made any entries on the health calendar. Although there were no significant differences in the age-sex distributions of the four components of the calendar group, extent of cooperation in calendar maintenance was related to income level. The proportion of households with family incomes exceeding $5,000 was greater in those households which maintained the calendar completely than in those showing lesser degrees of cooperation (table 22).

Table 21. Percentage distribution of health calendars by degree of completeness: California Health Survey, February–April 1955

(Excludes households in dwelling units for which a complete mailing address was not available at the time the health calendar was sent)

Degree of completeness	Percent of households
Health calendars sent	100
Entries for each of 28 days	17
Entries for fewer than 28 days	14
No entries or calendar lost	43
Respondent stated calendar not received	25
Measure of sample size	[illegible]

MORBIDITY REPORTING OF INTERVIEW-ONLY AND CALENDAR-INTERVIEW GROUPS. When the interviewer called at a household in the calendar-interview group, she conducted an interview in the regular fashion, using the health calendar only in determining the dates on which illnesses started and for adding conditions which had not been reported in response to the regular questionnaire. (There were relatively few such conditions.) The mailing of a health calendar did produce a substantial increase in the levels of illness reporting at interview, however. As shown in table 23, the illness incidence rate in the calendar-interview group was almost one-third higher than the corresponding rate in the interview-only group. Acute illness is primarily responsible for the increase.

Illness reporting in the calendar-interview group showed a marked relationship to the degree of completeness of the health calendar. For that portion of the calendar-interview group who made entries on the form, chronic illness rates were somewhat higher than for the comparison group and acute illness rates were almost twice as high. Even for persons who received the form but made no entries on it, the illness incidence rates exceed those for the noncalendar group. Table 24 presents similar comparisons for days of restricted

Table 22. Percentage distribution of households by family income, for interview-only group, and for calendar-interview group, according to degree of completeness of health calendars: California Health Survey, February–April 1955

(Excludes households in dwelling units for which a complete mailing address was not available at the time the health calendar was sent)

Family income [1]	Interview-only group: All households	Calendar-interview group				
		All households	Entries for each of 28 days	Entries for fewer than 28 days	No entries or calendar lost	Respondent stated calendar not received
All households	100	100	100	100	100	100
Less than $2,000	16	19	12	18	21	20
$2,000–$4,999	40	38	36	38	36	44
$5,000 and over	40	39	52	41	36	32
Not ascertained	4	4	—	3	7	4
Measure of sample size	*7.9*	*6.9*	*1.3*	*1.1*	*2.8*	*1.6*

[1] For those households in which there was more than one family, the income is that of the family to which the head of the household belonged.

Table 23. Incidence of illness per 100 persons per month, for interview-only group, and for calendar-interview group, according to degree of completeness of health calendars, by type of illness and whether activity restricting or bed disabling: California Health Survey, February–March 1955

(Excludes persons in dwelling units for which a complete mailing address was not available at the time the health calendar was sent)

Illness type and activity restriction	Interview-only group: All persons	Calendar-interview group				
		All persons	Entries for each of 28 days	Entries for fewer than 28 days	No entries or calendar lost	Respondent stated calendar not received
Total illness	49	63	82	84	55	49
With activity restriction	17	22	29	31	17	17
Bed disabling	11	14	20	19	11	10
Without activity restriction	31	42	55	52	38	32
Acute illness	23	36	46	50	30	29
With activity restriction	11	15	18	20	12	12
Bed disabling	7	10	12	12	9	8
Without activity restriction	12	21	29	30	17	17
Chronic illness	25	28	38	32	26	19
With activity restriction	6	7	12	11	5	4
Bed disabling	4	4	8	7	2	3
Without activity restriction	19	21	26	21	21	15
Measure of sample size	*7.9*	*6.9*	*1.3*	*1.1*	*2.8*	*1.6*

activity and bed disability and for chronic conditions. The rates for each portion of the calendar-interview group exceed the interview-only group rates only for acute illness days of restricted activity exclusive of days of bed disability. Use of the calendar form did not appear to raise the levels of chronic conditions reported in the calendar-interview group as a whole, although chronic condition rates decline consistently with decreasing degrees of co-operation.

Thus, advance mailing of a health calendar was most effective in increasing the reporting of acute illness, including illness causing some restriction of usual activities. The effect was apparent even for persons who received the calendar but did not maintain it.

FACTORS AFFECTING ILLNESS REPORTING. In the discussion of the length of the recall period (section 2), we pointed out that there was a consistent decline in the relative number of illnesses reported for each week of recall as the number of weeks prior to the week of interview increased (see discussion of table 12). Table 25 demonstrates that the advance mailing of the health calendar form led to improved recall. In this table, incidence of illness in the interview-only group is compared with that in

Table 24. Days of restricted activity and days of bed disability per 100 persons per month by type of illness, and chronic conditions per 100 persons by level of severity, for interview-only group, and for calendar-interview group, according to degree of completeness of health calendars: California Health Survey, February–March 1955

(Excludes persons in dwelling units for which a complete mailing address was not available at the time the health calendar was sent)

Item	Interview-only group: All persons	Calendar-interview group				
		All persons	Entries for each of 28 days	Entries for fewer than 28 days	No entries or calendar lost	Respondent stated calendar not received
	Days of restricted activity per 100 persons per month					
Total illness	208	214	198	264	197	222
Acute illness	59	78	72	106	70	79
Chronic illness	149	135	126	158	127	143
	Days of bed disability per 100 persons per month					
Total illness	94	94	103	99	82	105
Acute illness	28	34	28	45	27	42
Chronic illness	67	60	76	53	55	63
	Chronic conditions per 100 persons					
All levels of severity [1]	101	102	114	106	100	93
Substantial severity	53	53	59	56	51	50
Moderate severity or no reported effects	48	49	55	50	49	43
Measure of sample size	*7.9*	*6.9*	*1.3*	*1.1*	*2.8*	*1.6*

[1] See footnotes 1-3, table 8, for definitions of severity levels.

the calendar-interview group according to the week of the recall period in which the illness started. Incidence rates are expressed as a ratio to the rate for the last week of the 4-week recall period. For the last week (the period immediately prior to the week of interview) rates of illness from the calendar and noncalendar groups are about the same. For the other weeks the decline in incidence rates is much less pronounced for the calendar group than for the interview-only group. Minor acute illnesses, causing neither activity restriction nor medical attendance, exhibit the most improvement, although only 57 percent as many were reported in the fourth week as in the first week prior to the end of the recall period. Mailing of the calendar appeared to produce a fairly high level of reporting of activity-restricting or medically attended acute illness in each of the weeks preceding the interview week. Still, except for restricting or medically attended acute illness, there remained a substantial amount of memory loss.

As discussed in "Differences in Reported Morbidity Between Original Interviews and Reinterviews," (in section 6), household reporters may provide more complete illness information about themselves than they provide for "nonreporters" that is, related adults absent at the time of interview and children. In order to determine whether mailing the calendar led to more complete reporting of illness for nonreporters, ratios of the rates of illness for the calendar-interview group to the rates of the interview-only group were tabulated separately for adult reporters, adult nonreporters, and children (table 26). The data indicate that the increase in illness reporting was generally no greater for adult nonreporters than for adult reporters. For children, however, mailing a calendar produced a relatively greater increase in illness reporting than for either of the two adult respondent types.

The implications of relatively high acute illness reporting in the group which received the calendar but did not maintain it should also be

Table 25. Incidence of illness per 100 persons per week in the 4-week recall period, expressed as a ratio to the rate for the last week in the recall period, for interview-only group and calendar-interview group, by illness type and severity: California Health Survey, February–March 1955

(Excludes persons in dwelling units for which a complete mailing address was not available at the time the health calendar was sent. Excludes persons for whom interviews were obtained 1 or more weeks later than the scheduled week)

Illness type and severity	Incidence of illness in last week (week 1)	Number of weeks prior to end of recall period			
		1	2	3	4
		Ratio to the last week (week 1)			
INTERVIEW-ONLY GROUP					
Total illness	21. 2	1. 00	0. 53	0. 34	0. 26
With activity restriction and/or medical attendance	7. 3	1. 00	. 90	. 54	. 50
Without activity restriction or medical attendance	13. 8	1. 00	. 33	. 23	. 14
Acute illness	9. 4	1. 00	. 58	. 45	. 33
With activity restriction and/or medical attendance	4. 0	1. 00	. 96	. 71	. 57
Without activity restriction or medical attendance	5. 4	1. 00	. 30	. 25	. 15
Chronic illness	11. 8	1. 00	. 49	. 25	. 21
With activity restriction and/or medical attendance	3. 4	1. 00	. 83	. 35	. 41
Without activity restriction or medical attendance	8. 4	1. 00	. 35	. 21	. 13
CALENDAR-INTERVIEW GROUP					
Total illness	22. 0	1. 00	0. 64	0. 53	0. 54
With activity restriction and/or medical attendance	7. 7	1. 00	. 75	. 90	. 78
Without activity restriction or medical attendance	14. 3	1. 00	. 59	. 34	. 40
Acute illness	10. 6	1. 00	. 78	. 75	. 71
With activity restriction and/or medical attendance	4. 4	1. 00	. 86	1. 11	. 90
Without activity restriction or medical attendance	6. 2	1. 00	. 73	. 50	. 57
Chronic illness	11. 5	1. 00	. 52	. 33	. 37
With activity restriction and/or medical attendance	3. 3	1. 00	. 61	. 63	. 62
Without activity restriction or medical attendance	8. 2	1. 00	. 48	. 21	. 28
Measure of sample size:					
Interview-only group	*7. 6*				
Calendar-interview group	*6. 7*				

Table 26. Incidence of illness per 100 persons per month for the calendar-interview group, expressed as a ratio to the rate for the interview-only group, by respondent type and by illness type and severity: California Health Survey, February–March 1955

(Excludes persons in dwelling units for which a complete mailing address was not available at the time the health calendar was sent)

Illness type and severity	Incidence of illness in calendar-interview group							
	Rate per 100 persons per month				Ratio to interview-only group rate			
	All persons	Adult reporter	Nonreporter		All persons	Adult reporter	Nonreporter	
			Child	Adult			Child	Adult
Total illness	63	71	64	45	1. 31	1. 25	1. 50	1. 21
With activity restriction and/or medical attendance	27	26	38	16	1. 20	1. 20	1. 34	. 87
Without activity restriction or medical attendance	35	44	26	30	1. 41	1. 28	1. 83	1. 53
Acute illness	36	31	50	25	1. 54	1. 46	1. 63	1. 43
With activity restriction and/or medical attendance	17	12	31	9	1. 28	1. 21	1. 40	. 94
Without activity restriction or medical attendance	18	19	19	16	1. 90	1. 68	2. 22	2. 08
Chronic illness	27	40	14	20	1. 09	1. 12	1. 15	1. 01
With activity restriction and/or medical attendance	10	14	7	6	1. 09	1. 18	1. 09	. 78
Without activity restriction or medical attendance	17	26	7	14	1. 10	1. 09	1. 20	1. 17
Measure of sample size	*6. 9*	*3. 2*	*2. 2*	*1. 6*				

mentioned (table 23). It may be concluded that the letter itself, announcing that an interviewer would call to inquire about illnesses in a 4-week retrospective period, helped to increase the yield. Anticipation of an interview must have improved recall of illnesses starting during the 4-week period.

Summary

In the San Jose Survey health diaries maintained on a current basis for a month produced higher rates of minor acute illness than did interviews covering a calendar-month recall period. The cost of administering this diary-keeping program exceeded that of the interviewing program.

In the California Health Survey a relatively inexpensive modification of the diary was used experimentally. The "health calendar," mailed in advance of a specified 4-week recall period to be covered by subsequent interview, was expected to serve as a memory aid at interview. A substantial increase in illness reporting resulted, especially of acute illness. Improved reporting was particularly marked for interview reports covering children. Although cooperation in maintaining the calendars was poor, even household reporters not keeping the calendar reported more acute illness at interview than the interview-only group. Apparently the receipt of a request to maintain a health record heightened awareness and resulted in improved recall of illness for the period covered by the interview.

The calendar-interview method deserves further exploration. Effort should be concentrated on enlisting wider cooperation in completing the calendar. This might be accomplished by followup letters during the period for which the calendar is to be kept and by inquiries at interview as to reasons for not maintaining the calendar. There might also be a provision for advance distribution of the calendars to households lacking mailing addresses. The intent would be to develop a relatively inexpensive procedure which would permit extending the recall period at interview beyond that length which is possible without the use of a calendar.

5. Continued Observation of Panels: Repeat Interviews and Repeat Diaries

Many important health questions relate to the long-term effects of illness and to the long-term effects of other variables on illness. Longitudinal observation through periodic visits to a panel may be required to investigate the dynamic interrelations between illness and other factors. Some of the needs for such studies have recently been set forth by Feldman (*10*).

To evaluate such longitudinal information, one must know whether the effect of repeated observation has itself influenced the reporting of illness. One goal of the San Jose Survey was to examine experimentally the effects on illness data of repeated interviewing and repeated diary-keeping. This section presents data on the stability of panel membership, the effects of repeated observation on illness reporting, and some factors which aid in understanding the effects observed. It also considers how repeat interviews affect the reporting of chronic conditions.

The Experiment

As described in the discussion of figures 1 and 2, alternative procedures were used with six experimental groups in the San Jose Survey. One experimental group was given three repeat interviews covering the calendar-month recall periods succeeding that covered by the initial interview. Another group kept an initial diary for the remainder of the month following the date of initial interview, and then maintained a repeat diary for each of 3 succeeding months. Three experimental groups kept an initial diary and one repeat diary. The design is such that it is possible to compare illness data from repeat interviews with that from initial interviews covering the same calendar-month recall periods and to compare illness data from repeat diaries with that from initial diaries maintained for the same month.

The initial interview contained questions about illness "yesterday," the day preceding the day of interview. These were followed by questions about illness "last month" (the calendar-month recall period) and by questions about chronic conditions. For each condition reported, the interviewer asked further sets of questions about activity restriction, medical attendance, and other factors. The repeat interviews employed general questions about illness identical to those used on initial interviews. These were supplemented by probing questions which included a checklist of symptoms and direct references to specific types of medical care for illnesses occurring "yesterday" and "last month."

The initial and repeat diary booklets had a page, containing a line for each day of the month, for each member of the household. Each page contained columns headed by questions corresponding closely to the questions in the initial interview questionnaire.

When the initial diary was placed in the household, the interviewer instructed the household reporter in procedures for diary maintenance; similar instructions appeared in the diary booklet itself. Repeat diaries were mailed to the household so as to arrive just prior to the beginning of the month for which they were to be kept. Interviewers often visited households to aid in diary maintenance, because the household reporter had requested assistance, because previous reviews had indicated that further visits would be necessary, or in accordance with a preestablished assistance plan.

Stability of Panel Membership

In the experimental group scheduled for repeat interviews, all dwelling units, including those vacant, which fell into the household sample for the initial interview were visited in each of the 3 months following initial interview, except for refusals. (Refusals to participate in the survey were confirmed by a visit of the supervisor; once confirmed, no additional calls were made.) The number of persons for whom repeat interviews were obtained was influenced primarily by movements into and out of the households, by refusals, and by failure to find anyone at home. Table 27 shows gains and losses to the panel of households scheduled for repeat interviews. As a net result of these gains and losses, the number of persons for whom third repeat interviews were obtained was about 8 percent less than the number of persons covered by initial interviews. Part of the reason for this decline is

Table 27. Persons lost and gained each month of repeated interviewing as a percentage of persons interviewed in previous month, by reason for losses and gains: San Jose, April–June [1] 1952

Reason for losses and gains	Percent of previous month's persons			
	All repeat interviews	First repeat interview	Second repeat interview	Third repeat interview
Losses	6. 7	4. 8	6. 9	8. 4
Refusal	1. 3	1. 8	1. 1	. 8
Moved out	3. 6	1. 9	4. 2	4. 7
Not at home [2]	1. 8	1. 1	1. 5	2. 8
Died	. 1	—	. 1	. 1
Gains	4. 1	4. 9	3. 9	3. 4
Moved in	2. 5	2. 7	2. 9	2. 0
Not interviewed in previous month	1. 4	2. 0	. 9	1. 3
Not at home [2]	1. 2	2. 0	. 4	1. 2
Other reason [3]	. 2	—	. 5	. 1
Born	. 1	. 2	. 1	. 1
Measure of sample size	*46*	*15*	*15*	*15*

---

[1] Group II, first, second, and third repeat interviews.

[2] Includes "not at home after 3 or more calls" and "temporarily absent."

[3] Includes "no English-speaking respondent," "too ill to be interviewed," and "refused." (On a few occasions, when a refusal was encountered late in the month, the supervisor's confirming visit was made in the subsequent month and succeeded in pursuading the reporter to continue in the survey.)

that losses from confirmed refusals were not replaced. Also, the proportion of persons not at home after three or more calls increased from month to month. Refusal rates were highest (almost 2 percent) in the first repeat interview month and declined each month thereafter. The question of participating in a panel was not raised until the close of the initial interview.

For the experimental groups keeping diaries, dwelling units found vacant at the time of the initial interview were dropped from the sample. Except for a lower proportion of persons "moving in," the pattern of gains and losses for the repeat diary groups corresponded closely to that for the repeat interview group.

In the panel of dwelling units scheduled for repeat interviews, the number of persons intially interviewed suffered a net decrease of 8 percent by the time of the third repeat interview. Discounting persons gained by these dwelling units, almost 20 percent of the persons for whom initial interview information was obtained were lost by the time of the third repeat interview. This substantial percentage makes it important to consider whether the health status of persons lost from the panels differed from that of the persons who remained. The data in table 28 on this question provide no evidence that the initial interview health status of persons who remained in the panels differed from that of persons who left. (Nor were there significant differences in the initial interview health status of a small segment of persons for whom the household reporter would not keep a diary but who consented to be interviewed instead.)

Assistance Visits to Diary Keepers

The San Jose Survey plan included an experiment to determine whether varying patterns of assistance to diary keepers affected the level of illness reporting. All experimental groups keeping diaries were randomly divided into assistance groups, ranging from those who would receive intensive supervision through frequent visits by the interviewer to those who would receive no further communication after the diary was placed. Each assistance group received a prescribed pattern of visits, telephone or mail reminders, or no assistance. When assistance visits or editing of the diaries at the end of the month revealed that close supervision would continue to be necessary, visits by an interviewer were continued or started in addition to the planned pattern of assistance. Similarly, whenever diary keepers requested assistance visits, these were made. Therefore, a given household sometimes received more visits than envisaged by the experimental design.

Some information is available on whether assistance visits stimulated the household reporter to maintain the diary currently and to provide adequate illness information. Whenever the interviewer visited a household, she arranged to see the reporter who was keeping the diary, and reviewed the diary for com-

Table 28. Percentage of persons at initial interview with illness in calendar-month recall period and percentage with chronic conditions, for repeat interview group and for diary groups, by whether or not the persons initially interviewed remained in the panels for the subsequent month: San Jose, February–May [1] 1952

Method and measure	All persons interviewed initially	Persons remaining in panel		Persons lost from panel
		Total	Interviewed in lieu of diary	
Repeat interview group:				
Percent of persons ill in calendar-month recall period	33	32	. . .	48
Percent of persons with chronic conditions	44	40	. . .	38
Diary groups:				
Percent of persons ill in calendar-month recall period	34	34	33	29
Percent of persons with chronic conditions	42	42	54	44
Measure of sample size;				
Repeat interview group	*15*	*15*	. . .	*.74*
Diary groups	*68*	*65*	*1.7*	*3.5*

[1] Groups I–V, initial interviews.

pleteness of recording and for adequacy of illness descriptions. In table 29 are shown the various assistance patterns planned for the experimental group keeping three repeat diaries, together with the percentages of days for which the household reporter made daily entries. Those subgroups visited often under the planned assistance patterns do not show a larger proportion of daily entries completed by the reporter than do the groups visited less often. (For those days for which the household reporter did not make daily entries, the interviewer obtained and recorded the relevant information.)

When the diary was returned, it was edited to determine that an entry had been made for each person each day and that the requisite information for each illness had been supplied. If a diary had one or more inadequate entries, it "failed edit." Results from a special study of the relation of assistance visits to editing failures in first repeat diaries are shown in table 30. Thirty-five percent of the first repeat diaries failed initial edit. This proportion did not vary significantly among groups receiving planned assistance visits, groups visited for other purposes, and groups not visited (but receiving telephone or mail reminders). Thus, assistance visits caused no discernible increase in the proportion of diaries which "passed edit."

The volume of illness reported also was unrelated to the amount of assistance offered the diary keeper during the period of diary maintenance. This is consistent with the observation that assistance visits apparently did not raise the standards of diary maintenance.

One further question regarding assistance visits concerns the possible influence of such visits in promoting voluntary return of the diary. The special study of first repeat diaries provides some evidence on this point. Of households scheduled to maintain first repeat diaries, 12 percent failed to return the booklets,

Table 30. Percentage distribution of first repeat diaries by type of assistance visit and percentage of each assistance visit type that failed initial edit: San Jose, April [1] 1952

Type of assistance visit	Percent of all returned diaries	Percent of each assistance type that failed initial edit
All returned first repeat diaries	100	35
Planned assistance visits	57	35
Other visits because	28	33
Initial diary not returned	10	29
Initial diary failed initial office edit	13	39
Initial diary unsatisfactory at time of assistance visit	6	26
No visit (but telephone or mail reminder)	15	38
Measure of sample size	*15*	

[1] Group I.

Table 29. Percentage of days in diary sample for which the household reporters made daily entries, by subgroup assistance pattern: San Jose, March–June [1] 1952

Subgroup	Initial diaries [2]		First repeat diaries [3]		Second repeat diaries [4]		Third repeat diaries [5]	
	Assistance pattern	Percent of days	Assistance pattern	Percent of days	Assistance pattern	Percent of days	Assistance pattern	Percent of days
All subgroups	. . .	88	. . .	88	. . .	85	. . .	84
A	Visit	87	Visit	82	Visit	86	T or M	83
B	Visit	90	Visit	88	Visit	84	None	91
C	Visit	91	Visit	89	T or M	87	T or M	81
D	Visit	88	Visit	86	T or M	88	None	78
E	Visit	87	T or M	90	Visit	82	T or M	85
F	Visit	82	T or M	87	Visit	88	None	89
G	Visit	95	T or M	95	T or M	82	T or M	82
H	Visit	83	T or M	93	T or M	85	None	84

[1] Group I, initial, first, second, and third repeat diaries.

[2] All initial subgroups were visited once, half early in the month with telephone reminders later in the month; the other half had early telephone reminders and late visits.

[3] One-half received one assistance visit plus two telephone or mail reminders; the remainder received three telephone or mail reminders only.

[4] One-half received one visit, and the other half, one telephone or mail reminder.

[5] One-half received one telephone or mail reminder, and the other half had no type of assistance.

NOTE: T—telephone reminder; M—mail reminder. Mail was used only if the household had no telephone.

Table 31. Percentage distribution of households eligible for first repeat diaries by reason for not returning diaries: San Jose, April[1] 1952

Reason for not returning first repeat dairies	Percent
All eligible households	100
Diaries returned	88
Diaries not returned	12
Repeat interview requested by reporter in lieu of diary	7
Refused to maintain diary	2
Moved [2]	4
Measure of sample size	*16*

[1] Group I.

[2] Includes "temporarily absent."

but approximately half of these households provided interviews in place of keeping diaries (table 31). For those diaries which were returned, the pattern of receipt is summarized in table 32. Of the first repeat diaries received, 38 percent were mailed in voluntarily at the close of the diary month. Telephone reminders beginning 5 days later resulted in return of an additional 46 percent. If was necessary for an interviewer to call at the household to obtain the remaining 16 percent. For households receiving unscheduled assistance visits during the first repeat diary month because the initial diary was not maintained satisfactorily, 23 percent of the diaries had to be picked up by the interviewer. For households keeping the initial diary satisfactorily and receiving only a telephone or mail reminder that assistance for the first repeat diary was available if needed, only 4 percent of the diaries had to be picked up by the interviewer. Scheduled assistance visits had little effect on the pattern of diary receipt. Thus, although planned assistance visits did not promote voluntary return of the diary, these data indicate that those households which followed instructions for maintaining an adequate diary were more cooperative in returning it.

Effects of Continued Observation on Illness Reporting

During several months of continued observation of a panel of households, there is considerable variation in the persons comprising the panel. This is due to movements into and out of the households as well as refusals to continue in the panel. In order to isolate the effect of continued observation on morbidity reporting, we shall consider only persons who provided an initial interview and then remained in the panel until the survey's conclusion. (So long as persons did not join or leave the household after the initial interview or refuse to continue, they were considered to be in the panel even though data were not obtained for them every month.) We shall treat separately illness differentials between (*a*) initial and repeat interviews and (*b*) initial and repeat diaries.

INITIAL AND REPEAT INTERVIEWS. Selected morbidity rates for an experimental group which had an initial interview and first, second,

Table 32. Percentage distribution of households returning first repeat diaries by pattern of diary receipt according to type of assistance visit during month of diary maintenance: San Jose, April[1] 1952

Pattern of diary receipt	Total	Type of assistance visit during month of diary maintenance: Planned assistance visits	Other visits because of difficulties with initial diaries	No visit (but telephone or mail reminder)
Households returning diaries	100	100	100	100
Diaries returned voluntarily	38	42	25	48
Mailed after telephone reminder [2]	46	42	53	48
Picked up by interviewer [3]	16	16	23	4
Measure of sample size	*15*	*8*	*4.1*	*2.3*

[1] Group I.

[2] Telephone reminders started 5 days after the close of the diary-keeping month. Therefore this group may include some diaries that would have been mailed voluntarily, though late.

[3] Personal visits by interviewers started 2 weeks after the close of the diary-keeping month.

Table 33. Incidence of illness by illness type and severity, days of restricted activity and bed disability by type of illness, per 100 persons per month, percentage of persons ill on day before interview by type of illness and whether activity restricting or bed disabling, and chronic conditions per 100 persons by whether medically attended, comparing the repeat-interview group with initial interviews covering the same calendar-month recall periods: San Jose, February–May [1] 1952

(Excludes persons gained by the panels after the beginning of the survey or lost from the panels before its conclusion)

Item	Initial interviews				Group II			
	Group III	Group IV	Group V	Group VI	Initial interviews	Repeat interviews		
						First	Second	Third
	February	March	April	May	February	March	April	May
	Incidence of illness per 100 persons per month							
Total illness	34	34	27	25	28	20	17	18
With activity restriction and/or medical attendance	22	22	16	14	17	13	10	12
Without activity restriction or medical attendance	12	11	11	11	11	7	7	6
Acute illness	27	25	19	19	21	15	14	13
With activity restriction and/or medical attendance	17	17	11	11	12	10	8	9
Without activity restriction or medical attendance	9	8	8	8	9	5	6	4
Chronic illness	7	9	8	6	7	5	4	5
With activity restriction and/or medical attendance	5	5	5	2	5	3	2	3
Without activity restriction or medical attendance	3	4	3	3	2	2	1	2
	Days of restricted activity per 100 persons per month							
Total illness	148	131	109	87	155	90	70	89
Acute illness	95	86	54	47	79	54	37	45
Chronic illness	53	45	55	40	76	37	33	44
	Days of bed disability per 100 persons per month							
Total illness	75	61	58	43	76	49	35	46
Acute illness	38	41	24	21	34	27	10	20
Chronic illness	37	19	34	22	42	22	25	27

See footnote at end of table.

and third repeat interviews are presented in table 33. These interviews covered calendar-month illness recall periods for February, March, April, and May respectively. (The repeat interview morbidity data include only conditions elicited by illness recall questions identical to those asked at initial interview. Conditions elicited by the repeat interview supplementary questions are omitted. See section 1, discussion of figs. 4–6.) Morbidity data from this experimental group may be contrasted with initial interview data from four other experimental groups covering illness recall periods for the same 4 months covered by the repeat interviews.

Significant differences in morbidity rates between repeat interviews and initial interviews covering the same calendar month must be due to differences in the characteristics of the two procedures.

With regard to the monthly incidence of illness, the rates from the first repeat, second repeat, and third repeat interviews are each generally lower than the comparable rates from initial interviews. For days of restricted activity and bed disability, the rates from the first

Table 33. Incidence of illness by illness type and severity, days of restricted activity and bed disability by type of illness, per 100 persons per month, percentage of persons ill on day before interview by type of illness and whether activity restricting or bed disabling, and chronic conditions per 100 persons by whether medically attended, comparing the repeat-interview group with initial interviews covering the same calendar-month recall periods: San Jose, February–May [1] 1952—Continued

Item	Initial interviews				Group II			
	Group III	Group IV	Group V	Group VI	Initial interviews	Repeat interviews		
						First	Second	Third
	February	March	April	May	February	March	April	May
	Percent of persons ill on day before interview							
All persons	17. 6	13. 4	16. 4	10. 7	16. 8	10. 8	11. 0	7. 8
Activity restricted	5. 4	4. 3	4. 0	2. 4	6. 1	3. 9	3. 7	2. 6
Bed disabled	2. 1	2. 4	2. 0	1. 6	3. 9	2. 5	1. 9	1. 0
With acute illness	12. 7	9. 6	10. 4	6. 8	11. 3	6. 9	7. 6	5. 0
Activity restricted	3. 9	2. 9	2. 7	1. 5	3. 6	2. 4	2. 3	1. 1
Bed disabled	1. 2	1. 7	1. 4	1. 1	2. 1	1. 6	1. 1	. 5
With chronic illness	5. 0	3. 8	6. 0	3. 9	5. 5	3. 9	3. 4	2. 8
Activity restricted	1. 6	1. 4	1. 3	. 9	2. 4	1. 5	1. 4	1. 5
Bed disabled	. 9	. 6	. 6	. 5	1. 8	. 9	. 8	. 6
	Chronic conditions per 100 persons							
Total	62	59	62	49	61	. . .	. . .	. . .
Medically attended	47	43	47	39	45	. . .	. . .	. . .
Never medically attended	14	15	15	10	16	. . .	. . .	. . .
Measure of sample size	*17*	*17*	*16*	*16*	*14*	*14*	*14*	*14*

[1] Data on "Percent of persons ill on day before interview" and "Chronic conditions per 100 persons" (applying to the period March-June) are from the same interview groups from which the calendar-month recall data are obtained.

and second repeat interviews, but not the third, are surpassed by the comparable initial interview rates. The pattern for the percentage of persons ill on the day before interview is similar to that for the monthly incidence of illness.

(Only one set of data in table 33 casts doubt on the quality of the repeat interview information. For the initial interview of group II, the repeat interview group, the February incidence rate for activity-restricting or medically attended acute illness is substantially lower than that for the initial interview of group III. However, no significant differences between the initial interviews of the two groups appear in other measures of illness or chronic conditions. Hence, it is unlikely that the initial interview illness status of group II distorted the repeat interview illness findings for that group.)

INITIAL AND REPEAT DIARIES. In the San Jose Survey several experimental groups were scheduled to keep initial and first repeat diaries. One of the groups kept second and third repeat diaries as well. In table 34 initial diary illness data for April and May are contrasted with illness data from first repeat diaries kept for these same calendar months. Similar comparisons are made between first repeat and second repeat diaries kept for May. The relative decrease in incidence rates between initial and first repeat diaries persists in comparisons of first repeat with second repeat diaries. Rates for days of activity-restricting and bed-disabling illness do not show a similar decline. The decrease in incidence rates seems to result from lowered reporting of days of non-activity-restricting illness.

For third repeat diaries, maintained during the month of June, the experimental design does not provide a second repeat diary comparison group. However, the relative differences in illness rates between the May second repeat diary and the June third repeat diary parallel seasonal differences in illness rates between the two months (obtained by comparing first repeat diary data for May with first repeat diary data for June). Discounting seasonal trends, illness reporting on third repeat diaries appears not to lag behind that on second repeat diaries, except in the case of days of non-activity-restricting illness.

In summary, illness incidence rates are always lower on repeat than on initial diaries. The decline is pronounced for first and second repeat diaries and shows some evidence of

Table 34. Incidence of illness by illness type and severity, days of illness without restricted activity, days of restricted activity, and days of bed disability, by type of illness, per 100 persons per month, comparing initial with first repeat diary groups and other first repeat with second and third repeat diary groups: San Jose, April–June 1952

(Excludes persons gained by the panels after the beginning of the survey or lost from the panels before its conclusion. Includes about 2 percent of persons for whom the household reporter was unwilling to keep a diary, but for whom he consented to provide a repeat interview instead)

Illness type and severity	Initial diaries[1]	First repeat diaries	Repeat diaries			
			First	Second	First	Third
	Groups IV-V	Groups III-IV	Group IV	Group I	Group V	Group I
	April-May		May		June	
	Incidence of illness per 100 persons per month					
Total illness	58	49	49	38	46	33
With activity restriction and/or medical attendance	27	25	25	19	16	14
Without activity restriction or medical attendance	31	24	24	19	30	18
Acute illness	44	39	38	28	34	27
With activity restriction and/or medical attendance	20	20	19	14	10	12
Without activity restriction or medical attendance	24	19	19	14	23	15
Chronic illness	14	10	11	10	12	6
With activity restriction and/or medical attendance	7	5	6	5	4	3
Without activity restriction or medical attendance	7	5	5	5	7	3
	Days of illness without restricted activity per 100 persons per month					
Total illness	178	134	137	121	162	100
Acute illness	113	92	97	75	97	58
Chronic illness	65	42	40	46	65	42
	Days of restricted activity per 100 persons per month					
Total illness	102	108	104	115	70	93
Acute illness	68	75	68	61	39	42
Chronic illness	34	34	36	54	31	51
	Days of bed disability per 100 persons per month					
Total illness	40	32	29	37	21	28
Acute illness	24	22	19	15	12	10
Chronic illness	16	11	10	21	10	17
Measure of sample size	*32*	*32*	*16*	*14*	*15*	*13*

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[1] Since initial diaries covered only that portion of a month remaining after interview, it was necessary to adjust rates to a whole-month basis, on the assumption that illness reported in the later part of the month was representative of the entire month. The trend of illness was downward during the months of April-May, so the adjusted rates are probably an underestimate of the rates that would have been obtained had the initial diaries been kept for a whole month.

leveling off for third repeat diaries. Continued diary-keeping does not appear to affect the reporting of days of restricted activity, but it does decrease the reporting of non-activity-restricting days of illness.

Factors Affecting Illness Reporting in Panels

We have examined the effect of continued observation of panels, by means of interviews covering successive calendar-month recall periods and through diaries maintained during consecutive calendar months. Experiments with each of these two procedures for collecting data showed that the monthly incidence of illness reported on initial application of a given procedure exceeded that reported when the procedure was repeated. Let us consider for each procedure some factors which might account for these illness differentials.

INITIAL AND REPEAT INTERVIEWS. In table 35 average monthly illness rates for first, second, and third repeat interviews covering March, April, and May respectively are contrasted with average monthly illness rates from three initial interviews covering the same months. These data provide a general summary of differences in illness rates between initial and repeat interviews. They will be used as a reference point for many of the analyses which follow.

In other sections of this report we have considered factors which influence the recall of illness at interview. These factors include the interval between the interview date and the recall period, memory biases resulting from the length of the recall period, and the use of proxy respondents. Let us consider whether the selective influence of these and other factors could have produced the divergence in illness rates shown in table 35.

Interviews covering illness in a given calendar-month recall period took place throughout the interview month following the recall period. In an analysis of initial interviews described in section 3, we found that the incidence rates of illnesses reported for the calendar-month recall period decline as the interval between the end of the calendar month and the date of initial interview increases (see discussion of table 15). Twice the proportion of repeat as compared

Table 35. Incidence of illness by illness type and severity, days of restricted activity and bed disability by type of illness, per 100 persons per month, and percentage of persons ill on day before interview by type of illness, for initial interviews and for repeat interviews covering the same calendar-month recall periods: San Jose, March-May[1] 1952

(Excludes persons gained by the panels after the beginning of the survey or lost from the panels before its conclusion)

Illness type and severity	Initial interviews, groups IV-VI	Repeat interviews, group II
	Incidence of illness per 100 persons per month	
Total illness	29	19
With activity restriction and/or medical attendance	18	12
Without activity restriction or medical attendance	11	7
Acute illness	21	14
With activity restriction and/or medical attendance	13	9
Without activity restriction or medical attendance	8	5
Chronic illness	8	4
With activity restriction and/or medical attendance	4	3
Without activity restriction or medical attendance	3	2
	Days of restricted activity per 100 persons per month	
Total illness	109	83
Acute illness	63	45
Chronic illness	47	38
	Days of bed disability per 100 persons per month	
Total illness	54	43
Acute illness	29	19
Chronic illness	25	25
	Percent of persons ill on day before interview	
All persons	13. 4	9. 9
Activity restricted	3. 6	3. 4
Bed disabled	2. 0	1. 8
With acute illness	8. 9	6. 5
Activity restricted	2. 4	2. 0
Bed disabled	1. 4	1. 1
With chronic illness	4. 5	3. 4
Activity restricted	1. 2	1. 5
Bed disabled	. 6	. 7
Measure of sample size	*49*	*42*

[1] Groups IV-VI, initial interviews; group II, first, second, and third repeat interviews.

Table 36. Incidence of illness per 100 persons per month by illness type and severity, and percentage of persons ill on day before interview by illness type, according to interval between end of calendar-month recall period and repeat interview date, expressed as a ratio to the rate for repeat interviews conducted in the first week of the interview month: San Jose, March–May [1] 1952

Illness type and severity	Illness rate		Number of weeks between end of calendar-month recall period and interview date		
	All weeks	First week	1 or less	1-2	More than 2
			Ratio [2] to first week		
	Incidence of illness per 100 persons per month				
Total illness	19	21	1. 00	0. 88	0. 94
With activity restriction and/or medical attendance	12	13	1. 00	. 90	. 91
Without activity restriction or medical attendance	7	8	1. 00	. 83	. 99
Acute illness	14	16	1. 00	. 88	1. 00
With activity restriction and/or medical attendance	9	10	1. 00	. 91	. 93
Without activity restriction or medical attendance	5	6	1. 00	. 83	1. 10
Chronic illness	4	5	1. 00	. 87	. 77
With activity restriction and/or medical attendance	3	3	1. 00	. 88	. 84
Without activity restriction or medical attendance	2	2	1. 00	. 80	. 60
	Percent of persons ill on day before interview				
All persons	10	10	1. 00	1. 04	1. 30
With acute illness	6	6	1. 00	1. 06	. 98
With chronic illness	4	3	1. 00	1. 00	1. 88
Measure of sample size	*46*				

[1] Group II, first, second, and third repeat interviews. [2] Ratios were computed before the illness rates were rounded.

with initial interviews took place after the first week of the interview month.[4] If rates of illness on repeat interviews exhibited a similar decline as the interval between the end of the recall period and the interview increased, this could aid in accounting for the overall lower rate of illness reporting on repeat as compared with initial interviews. Therefore, it is important to see if the relation of week of repeat interview to illness reporting is the same as that for week of initial interview.

In table 36 the monthly incidence rates for each week of repeat interviewing are expressed as a ratio to the rates obtained in the first week of the interview month. As the interval between the end of the recall period and the week of repeat interview increases, the decline in incidence rates is slight in comparison with the corresponding decline for initial interviews (table 15). Hence, differences between initial and repeat interviews in the proportions of persons interviewed in the various weeks of the interview month do not account for the illness differentials between initial and repeat interviews.

The illness data summarized in table 35 include a measure which might be expected to have a minimum of memory bias. This measure is the percentage of persons having an illness on the day before interview. For most kinds of illness, the percentage of persons ill on the days before repeat interviews is less than the corresponding percentage for initial interviews carried out during the same months. These findings could have been produced by erroneous exclusions (underreporting) at repeat interview, by erroneous inclusions (overreporting) at initial interview, or by a combination of both. The repeat interview-initial interview differentials for persons ill on the day before interview generally parallel those for illness in the calendar-month recall period. It seems plausible, therefore, that both underreporting and overreporting might have contributed to the divergence in illness rates in the calendar-month recall period.

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[4] Fifty-seven percent of the repeat interviews, whose illness rates are summarized in table 35, occurred more than a week after the end of the the calendar-month recall period, whereas only 26 percent of the comparable initial interviews occurred more than a week after the close of the recall period. See table 14.

Before turning to more direct evidence on levels of underreporting and overreporting in the initial and repeat interviews, we shall examine the household survey data for indications of relatively greater memory loss on repeat than on initial interviews. In table 37 the incidence of illness is tabulated according to the number of weeks elapsing between the week of onset and the beginning of the month of interview. Since the three calendar-month recall periods covered in table 37 each contain more than 4 full weeks, illnesses with reported onset on the first days of the month are assigned to a part week. Incidence rates for the part week are adjusted to a whole-week basis. They, together with the rates for each full week, are expressed as a ratio to the rate for the last week in the calendar-month recall period, the week immediately prior to the month of interview. For this last week, the rates of illness reported at initial interviews are considerably higher than comparable rates on repeat interviews for all classes of illness. Further, for the 4 full weeks in the calendar month, recall of most classes of illness is somewhat better for initial than for repeat interviews.

Table 37. Incidence of illness per 100 persons per week in the calendar-month recall period, expressed as a ratio to the rate for the last week in the calendar-month recall period, for initial interviews and repeat interviews, by illness type and severity: San Jose, March–May [1] 1952

(Excludes persons gained by the panels after the beginning of the survey or lost from the panels before its conclusion)

Illness type and severity	Incidence of illness in last week (week 1)	Number of weeks prior to end of recall period				
		1	2	3	4	More than 4 [2]
		Ratio to the last week (week 1)				
INITIAL INTERVIEWS						
Total illness	7. 2	1. 00	0. 71	0. 93	0. 66	1. 80
With activity restriction and/or medical attendance	3. 9	1. 00	. 72	. 99	. 94	2. 14
Without activity restriction or medical attendance	3. 3	1. 00	. 70	. 86	. 31	1. 40
Acute illness	5. 3	1. 00	. 78	. 98	. 62	1. 40
With activity restriction and/or medical attendance	3. 1	1. 00	. 72	. 99	. 84	1. 79
Without activity restriction or medical attendance	2. 2	1 00	. 86	. 96	. 31	. 85
Chronic illness	1. 8	1. 00	. 50	. 81	. 78	2. 94
With activity restriction and/or medical attendance	. 8	1. 00	. 69	1. 00	1. 35	3. 33
Without activity restriction or medical attendance	1. 0	1. 00	. 34	. 66	. 31	2. 62
REPEAT INTERVIEWS						
Total illness	5. 6	1. 00	. 69	. 76	. 47	. 96
With activity restriction and/or medical attendance	3. 3	1. 00	. 83	. 87	. 49	. 99
Without activity restriction or medical attendance	2. 3	1. 00	. 49	. 62	. 44	. 92
Acute illness	4. 4	1. 00	. 73	. 72	. 49	. 80
With activity restriction and/or medical attendance	2. 5	1. 00	. 93	. 87	. 54	. 86
Without activity restriction or medical attendance	1. 9	1. 00	. 47	. 53	. 43	. 72
Chronic illness	1. 3	1. 00	. 57	. 91	. 40	1. 50
With activity restriction and/or medical attendance	. 8	1. 00	. 57	. 87	. 35	1. 37
Without activity restriction or medical attendance	. 4	1. 00	. 58	1. 00	. 50	1. 75
Measure of sample size:						
Initial interviews	*49*					
Repeat interviews	*42*					

[1] Groups IV–VI, initial interviews; group II, first, second, and third repeat interviews.

[2] Illness reported as starting on the first days of the month, which were more than 28 days from the end of the month. There was an average of 2.67 such days in the March–May period. The rates on which the ratios are based were adjusted to a full-week basis.

On both initial and repeat interviews a disproportionate share of illnesses was reported as starting in the part week consisting of the first days of the calendar month. Such disproportionate assignment of dates of onset was more pronounced on initial interviews than on repeat interviews. Some of these may be illnesses that started prior to the calendar month of recall.

Thus, examination of the week of onset of illness within the calendar-month recall period reveals three characteristics distinguishing initial from repeat interviews. Initial interviews show higher illness rates for the week immediately prior to the interview month, a somewhat less steep rate of decline as the interval increases between the interview month and the week of onset, and assignment of a greater share of illness to the first days of the calendar-month recall period. Each of these characteristics is consistent with higher rates of illness on initial than on repeat interviews. Let us now turn to more direct evidence of memory bias on initial and repeat interviews.

Criterion sources do not exist for evaluating completeness of reporting for all classes of illness in the survey. For medically attended illness, however, physician reports provide some evidence on the relative importance of underreporting and overreporting on initial and repeat interviews. Section 1 of part II of this report describes how physicians provided independent reports of medically attended illnesses for persons included in the experimental group given repeat interviews. Results of a comparison of survey reports of medically attended illness on initial and repeat interviews with physician records are given in table 38. Medically attended illnesses reported in the survey which did not "match" physician-reported illnesses are classed as overreports. Physician reports not matching medically attended illness from the survey are classed as underreports. Numerous qualifications attending the collection and analysis of these data prevent definitive statements about absolute levels of underreporting and overreporting in the survey. These qualifications (discussed in section 1 of part II, "Inquiries of Physicians") do not affect their usefulness for investigating differentials between initial and repeat interviews in the relative frequency of overreporting and underreporting.

On initial interviews 40 percent of the reports of medically attended illness are classed as overreports, while on repeat interviews the proportion of overreports drops to 19 percent. Using interview reports of medically attended illness as an arbitrary percentage base, 46 percent at initial interview were underreports. On repeat interviews the proportion of underreports rises to 72 percent. Thus, medically attended illness is characterized by considerably more overreporting and considerably less underreporting on initial interviews than on repeat interviews. It seems plausible that this mechanism probably holds for nonmedically attended illnesses as well. The increase in underreporting and decrease in overreporting at repeat interview is consistent then with the lower repeat interview illness rates previously noted.

In the San Jose Survey an adult household reporter supplied morbidity information for related adults and children. The relative divergence in illness reporting between initial and repeat interviews was about the same for adult reporters, adult nonreporters, and children.

Among the other factors which might influence illness reporting on repeat interviews,

Table 38. Percentage of initial interview and repeat interview reports of monthly prevalence of medically attended illnesses which were matched, overreported, and underreported when compared with physician reports: San Jose, February–May [1] 1952

(Data apply only to persons who named a local physician as the "doctor he usually goes to," who gave authorization to request a physician's report, and for whom the physician named responded. Excludes persons living outside the San Jose city limits)

Results of comparison	Initial interview	Repeat interviews
Interview reports of medically attended illness	100	100
Matched with physician reports [2]	60	81
Overreports—reported on interview but not by physician [3]	40	19
Underreports—not reported on interview but reported by physician [3]	46	72
Number of interview reports of medically attended illness	*83*	*150*

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[1] Group II, initial interviews; group II, first, second, and third repeat interviews.

[2] Includes cases of reporter-physician disagreement regarding the description of the illness (dissimilarity of diagnosis, symptoms, or anatomy) but with agreement regarding the month of illness.

[3] Includes cases of reporter-physician agreement regarding the description of the illness (similarity of diagnosis, symptoms, or anatomy) but with disagreement as to the month of illness.

two, both involving the respondent's anticipation of the repeat interview, deserve particular mention.

A California Health Survey experiment suggests that advance notice that an interviewer was to call to inquire about a specified period improved the recall of illness for that period (section 4, "Factors Affecting Illness Reporting"). Upon completing the initial interview in the San Jose Survey, the interviewer told the household reporter that she would call again to ask about subsequent months. This advance notice may have heightened awareness of illness occurring during the calendar month to be covered at repeat interview and may have led to improved recall.

The use of supplemental questions on the repeat interviews may have counteracted this tendency toward improved recall. Supplemental questions concerning illness symptoms and the taking of medicines and treatment for illness resulted in a substantial increase in the levels of illness reported (see discussion of tables 2 and 3). These question were asked following the general illness questions used on initial and repeat interviews. Only illnesses elicited by the general questions were used in contrasting repeat with initial interviews. One can conjecture that supplemental probing questions on the first repeat interview may have created the expectation that probing questions would be asked in the second and third repeat interviews as well. This could have decreased reporting of illness in response to the general questions on second and third repeat interviews.

In seeking to account for lower levels of illness reporting on repeat than on initial interviews, we have examined various lines of evidence. It is difficult to isolate specific factors accounting for the divergence in illness levels. Illness levels on initial interviews appear to be a consequence of high motivation for reporting illness combined with severe problems in recall. The initial interview experience provided a basis for anticipating the repeat interview situation. Illness levels on repeat interviews appeared to result from lower motivation for reporting illness and from reduced problems in recall.

INITIAL AND REPEAT DIARIES. Two features distinguish the search for factors affecting illness reporting on initial and repeat diaries from the corresponding search on initial and repeat interviews. First, diaries were supposed to be kept daily and were not as subject to recall difficulties as were interviews. Second, the divergence in illness rates between initial and repeat diaries held for illness incidence and days of illness without restricted activity but not for days of activity restriction due to illness (table 34).

If the interviewer visited the household during the month of diary-keeping, she reviewed the diary and made entries for diary days which had been left blank. There were no significant differences between initial and repeat diaries in the percentage of diary days filled in by the household reporter (table 29). Thus, we have no evidence that a decline in the quality of diary-keeping produced the divergence in illness incidence between initial and repeat diaries.

For one of the San Jose Survey experimental groups keeping initial and first repeat diaries, physician reports provide some evidence on the relative importance of overreporting of medically attended illness. (Since inquiries were sent only to physicians named as treating illnesses or chronic conditions but not to those named in response to the question, "Does he have a doctor he usually goes to?," it is not possible to derive the same measure of underreporting of medically attended illness as for the group given repeat interviews.) As shown

Table 39. Percentage of initial diary and first repeat diary reports of monthly prevalence of medically attended illnesses which were matched or overreported when compared with physician reports: San Jose, March–April [1] 1952

(Data apply only to persons who named a local physician as treating illnesses or chronic conditions, who gave authorization to request a physician's report, and for whom the physician named responded. Excludes persons living outside the San Jose city limits)

Results of comparison	Initial diary	First repeat diary
Diary reports of medically attended illness	100	100
Matched with physician reports [2]	80	84
Overreports—reported in diary but not by physician [3]	20	16
Number of diary reports of medically attended illness	*75*	*73*

[1] Group III, initial diaries; group III, first repeat diaries.
[2] See footnote 2, table 38.
[3] See footnote 3, table 38.

in table 39, the proportion of overreported medically attended illnesses is smaller on the first repeat than on the initial diary, 16 percent compared with 20 percent, but the difference is not statistically significant.

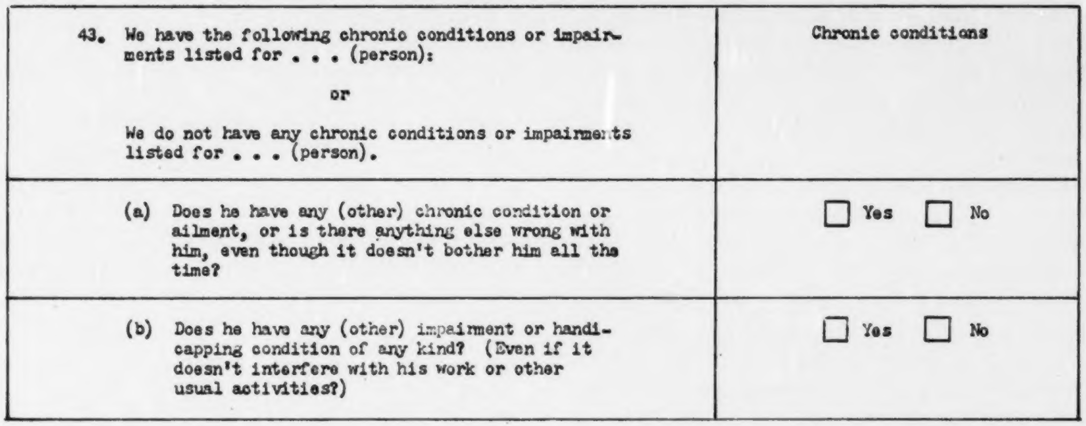
The decline in illness reporting on repeat diaries is most pronounced for illnesses causing neither activity restriction nor medical attendance. This suggests that as time went by there was an increasing tendency to omit the reporting of minor illness.

Chronic Condition Reporting on Repeat Interviews

The experimental group given repeat interviews provided some evidence on the completeness of reporting of chronic conditions at initial interview.

In the initial interview, following the questions about illnesses "yesterday" and "last month," the interviewer asked two general questions about chronic conditions (Q. 43) and about impairments (Q. 44) and then read a list of specific chronic conditions and impairments (Q. 45). (The initial interview questions are reproduced in fig. 3.) In the first repeat interview, the initial interview reports of persons with and without chronic conditions were reviewed in question 43, shown in figure 11. This review was followed by a reiteration of the initial interview questions about chronic conditions (Q. 43a) and impairments (Q. 43b). The second and third repeat interviews contained no specific questions about chronic conditions, but chronic conditions were often elicited by questions about illness "yesterday" and "last month."

Figure 11. Chronic condition review questions: San Jose Survey [1]



43. We have the following chronic conditions or impairments listed for . . . (person): or We do not have any chronic conditions or impairments listed for . . . (person).	Chronic conditions
(a) Does he have any (other) chronic condition or ailment, or is there anything else wrong with him, even though it doesn't bother him all the time?	☐ Yes ☐ No
(b) Does he have any (other) impairment or handicapping condition of any kind? (Even if it doesn't interfere with his work or other usual activities?)	☐ Yes ☐ No

[1] Group II, first repeat interviews.

Table 40. Chronic conditions per 100 persons at initial interview, and additional chronic conditions per 100 persons reported each month of repeat interviewing, expressed as a percentage of the rate for initial interviews, by whether medically attended: San Jose, February–May [1] 1952

(Excludes persons gained by the panel after the beginning of the survey or lost from the panel before its conclusion)

Type	Chronic conditions per 100 persons at initial interview	Additional chronic conditions per 100 persons (percent of initial interview rate)			
		All repeat interviews	First repeat interview	Second repeat interview	Third repeat interview
Total chronic conditions	61	31	19	6	7
Medically attended	45	16	11	2	2
Never medically attended	16	75	40	15	21
Measure of sample size	*14*				

[1] Group II, initial interviews, first, second, and third repeat interviews.

The relative increase over initial interview chronic condition rates on each of the three repeat interviews is shown in table 40. On the first repeat interview, where there was deliberate probing for chronic conditions, an additional 19 percent of chronic conditions were reported for the first time. Even on the second and third repeat interviews, where there was no specific probing for chronic conditions, there was an increment of more than 5 percent each month resulting from questions about recent illness. For each month of repeat interviewing, the relative increase was greater for chronic conditions which were never medically attended than for those which had been medically attended at some time. Thus, repeat interviews covering successive calendar-month recall periods elicited additional chronic conditions. For a given household in the San Jose Survey, morbidity information for each successive month was not always provided by the same household reporter. Therefore, part of the increase from month to month may have been due to changing household reporters.

The reinterviews of adults who responded for themselves at original interview in the California Health Survey provided another opportunity to observe whether a second interview results in increased reporting of chronic conditions. (The general results from this reinterview survey are presented in section 6, "Differences in Reported Morbidity Between Original Interviews and Reinterviews.") Selected findings from the California Health Survey reinterview are shown in table 41. In the independent reinterview, conducted with the original interview reporter without reference to the results of the original interview questionnaire, the chronic condition rates are about the same as those reported at the original interview. However, about 19 percent of the chronic conditions reported at independent reinterview were not reported on the original interview, while 17 percent of the chronic conditions reported at the original interview were not reported at independent reinterview (table 54). After a "reconciliation," in which the reporter was told about the discrepancies between the two interview situations, the reporter usually admitted having the chronic condition which he had listed on original interview but failed to mention on independent reinterview. He also did not disavow any of the chronic conditions named on the independent reinterview that were not on the original interview. These processes result in a net increase in chronic conditions of about 16 percent between the original interview and reconciled reinterview. This increase is confined mainly to those chronic conditions which had moderate or no reported effects on the individual's behavior.

Table 41. Chronic conditions per 100 reporters at reconciled reinterview, at independent reinterview, and at original interview, with differences between reconciled reinterview and original interview chronic conditions as a percentage of original interview chronic conditions, by level of severity: California Health Survey PES, July 1954–March 1955

(Data are derived from independent reinterview subsample. Reporters found on reinterview to have been underreported or overreported are excluded. See table D-1)

Type of interview	Total chronic conditions	Level of severity [1]		
		Substantial	Moderate	No reported effects
Reconciled reinterview	168	78	55	36
Independent reinterview [2]	148	74	47	27
Original interview	145	75	40	30
Net difference between reconciled reinterview and original interview (percent) [3]	16	4	35	20
Measure of sample size for net difference [4]	*20*	*10*	*5.4*	*4.0*

[1] See footnotes 1-3, table 8, for definitions of severity levels.

[2] Data are based only on conditions reported at independent reinterview, but the classification by type of condition and level of severity is from the reconciled reinterview.

[3] Percentage base is the original interview rate.

[4] For chronic condition rates, the measure of sample size is 17.

Thus, evidence from both the San Jose and California Health Surveys suggests that for the most intensive coverage of chronic conditions having only minor manifestations, it is necessary to conduct reinterviews on successive occasions.

Summary

In the San Jose Survey, panels of households were scheduled to be interviewed or maintain diaries for successive calendar months. Movements into and out of the households, difficulties in finding persons at home, and refusals made for instability in panel membership, resulting in a net monthly loss of 2 to 3 percent. The health status of persons lost from the panels did not differ greatly from the health status of those who remained.

Incidence of illness and days of restricted activity due to illness were generally lower on repeat interviews than on initial interviews. The influence of confounding factors makes it difficult to pinpoint specific elements contributing to the divergence in illness rates. Illness reporting on initial interviews appeared to be characterized by high memory variability combined with a willingness to cooperate. Illness reporting on repeat interviews seemed to exhibit less memory variability and a lower degree of cooperation.

The incidence of illness on repeat diaries was lower than on initial diaries, but there was no corresponding reduction in days of illness-caused activity restriction. The degree of assistance given to dairy keepers affected neither the quality of diary maintenance nor the amount of illness reported. The definition of illness applied on initial diaries appeared to be very broad, including a number of minor manifestations causing neither activity restriction nor medical attendance. The lower reporting of illness on repeat diaries may have resulted from an increasingly restricted definition of illness and from consolidation of periods of related illness.

Repeated observation appears to be necessary for full reporting of chronic conditions, especially those not currently causing trouble.

Contemporary techniques for obtaining morbidity information are much improved over those used in the San Jose Survey, and should lead to a reduction in response biases. The time is ripe for new experiments on the effects of continued observation of panels. The San Jose experience suggests that such experiments should include efforts to maintain morbidity reporting at a high level during the observation period.

6. Respondent Selection at Original Interview: Evaluation by Reinterview

One major problem in planning a household morbidity survey is respondent selection. Disregarding response errors, it is clearly more economical to interview only one responsible member of the household, asking that person to serve as proxy respondent for all other household members, than to interview all household members for themselves. The use of parents as proxy respondents for children seems justified, by and large. The information supplied by proxy respondents for other adult household members usually will not be as complete or as accurate as that which those adults can supply for themselves. The errors which may result when some adults are not interviewed for themselves must be balanced against the savings realized through the use of proxy respondents.

We shall define two major respondent types: reporters and nonreporters. Persons who furnished morbidity information for themselves in the survey will be referred to as reporters. Persons for whom the reporter served as proxy respondent will be termed nonreporters.

In the San Jose Survey, any responsible adult member of a household could serve as proxy respondent for all related members of the household. Information for persons under 18 years was obtained from the adult responsible for their care, generally the mother. (Persons not related to the head of the household were interviewed separately.) In order to evaluate the quality of data provided for adult nonreporters by their proxy respondents, a subsample of 118 nonreporters was reinterviewed directly, using the same questionnaire as that used in the original interview. The reinterview was conducted independently, without reference to the illness information which had been supplied by

Table 42. Incidence of illness per 100 reinterviewed nonreporters per month at independent reinterview and at original interview, with net differences, matched, overreported, and underreported illnesses as a percentage of original interview illnesses, by illness type and severity: San Jose reinterview sample, April-May [1] 1952

(Figures are weighted inversely as the number of nonreporters in the household and are representative of adults from households in which there were one or more adult nonreporters)

Results of comparison	Total illness			Acute illness			Chronic illness		
	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.
	Incidence of illness per 100 reinterviewed nonreporters per month								
Independent reinterview [2]	31	17	14	21	11	11	9	6	3
Original interview	25	10	15	15	7	9	9	3	6
Net difference (percent)	24	67	−5	39	60	23	—	80	−44
	Percent of original interview illnesses								
Total original interview illnesses	100	100	100	100	100	100	100	100	100
Matched with independent reinterview illnesses [3]	43	53	36	35	50	23	57	60	56
Overreports—reported on original interview but not on independent reinterview	57	47	64	65	50	77	43	40	44
Underreports—not on original interview but reported on independent reinterview [2]	76	87	68	100	100	100	36	60	22
Measure of sample size for incidence rates	*1.8*	*1.8*	*1.8*	*1.8*	*1.8*	*1.8*	*1.8*	*1.8*	*1.8*

[1] Group II, second and third repeat interviews. Based on 1 person in each of 118 households.

[2] Based on reinterview illnesses reported independently of original interview information.

[3] Illnesses were considered to be the same if both reports referred to the nature of the illness in similar terms and if the reports agreed on two of three criteria: (*a*) presence or absence of activity restriction, (*b*) whether or not medically attended, (*c*) interval between reported dates of onset not greater than 7 days.

the proxy respondent at original interview.[5] When adults who were nonreporters at original interview were interviewed directly, they recalled a somewhat greater incidence of illness than was originally reported for them by their proxy respondents (table 42). This difference was confined to acute illnesses, for which the reinterview rate was 39 percent higher than the original interview rate. These net differences tended to mask a startling lack of agreement between illness information supplied by the proxy respondent and by the person himself. Of the illnesses reported by the proxy respondent as starting during the calendar-month recall period, 57 percent were overreports, that is, illnesses not reported independently by the nonreporter when interviewed directly. An additional 76 percent were underreports, that is, illnesses mentioned by the erstwhile nonreporter at reinterview but not mentioned by the proxy respondent at original interview (table 42).[6]

Some of the medical record data gathered in the San Jose Survey provided a further opportunity for evaluating the morbidity data supplied for adult nonreporters, through comparisons with the data supplied by the household reporters for themselves. Despite difficulties in using data from records (other than hospital records) to "validate" survey data, medical record data gathered in the San Jose Survey are useful in evaluating sample survey procedures (see section 1 of part II).

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[5] In order to minimize differentials in memory loss between the two interview situations, it would have been desirable to make the time period between the original interview and the reinterview as short as possible. The interval between the two interviews averaged about 14 days.

[6] The fact that the percentage of underreports minus the percentage of overreports does not equal the percentage net difference between rates is accounted for by shifts in the classification of matched conditions. See the discussion of tables 51 and 52.

On comparison with survey reports of medically attended illness, most of the medical records examined show less agreement for adult nonreporters than for adult reporters (table 43).

Hence, the evidence from the San Jose Survey indicated that illness reporting for adult nonreporters was subject to considerable response variability and bias. Because of limited sample size and numerous other qualifications, this evidence could not be considered definitive. Accordingly, in the California Health Survey, a major effort was devoted to conducting a Post Enumeration Survey (PES), in which the subject of respondent selection received further attention.

After a brief description of the reinterview objectives and procedures in the Post Enumeration Survey, we shall attempt to evaluate the quality of the reinterview. This will be followed by a description of morbidity differentials between reinterviews and original interviews for the various original interview respondent types, and by some speculations about the causes of these morbidity differentials.

Post Enumeration Survey

The California Health Survey of 1954–55 covered about 10,000 households, with the sample being randomized over 52 weeks of interview. Interviewers inquired about illness during the 4-week recall period preceding the week of interview and about chronic conditions. As a result of the limited investigation of respondent selection in the San Jose Survey, each adult in the California Health Survey, if he was at home, was asked to report about his own illnesses and chronic conditions. For adults not at home when the interviewer called, a responsible related adult who knew about health of the absent member served as proxy respondent. Information about children under 18 years was supplied by a parent or other adult who was usually responsible for their care.

The major methodological effort of the California Health Survey was an investigation of respondent biases and of response variability in a Post Enumeration Survey. (Subsidiary objectives of the PES are described elsewhere in this report: estimation of the coverage error in appendix D and control of the interviewing quality in the California Health Survey in part I, section 7.) The PES included a reinterview of a subsample of persons from the California Health Survey, using the same morbidity questions and time references as on the original interview.

In order to investigate respondent biases, adults having proxy respondents at original interview (adult nonreporters) were reinterviewed directly. Reinterviews also were conducted with adult reporters and with proxy

Table 43. Percentage of medical record reports which were matched, underreported, and overreported when compared with survey reports of monthly prevalence of medically attended illness and of hospitalization, according to type of medical record and adult respondent type: San Jose, January–June [1] 1952

(Excludes persons living outside the San Jose city limits)

Results of comparison	Calendar-month medical attendance [2]						Calendar-year hospitalization [3]	
	Emergency clinic cards		Physician's first report of work injuries		Disability insurance claims		Hospital records	
	Reporter	Adult nonreporter	Reporter	Adult nonreporter	Reporter	Adult nonreporter	Reporter	Adult nonreporter
Total medical record reports of illness	100	100	100	100	100	100	100	100
Matched with survey reports	67	43	75	52	84	100	85	72
Underreports—reported in medical records but not in survey	33	57	25	48	16	—	15	28
Overreports—not reported in medical records but reported in survey	...	...	...	...	...	...	10	24
Number of medical record reports	*12*	*7*	*16*	*23*	*31*	*15*	*153*	*46*

[1] Calendar-month data from groups I–VI, initial and repeat interviews and diaries. Calendar-year data from groups I–VI, initial interviews.

[2] Medical record reports apply to January-June 1952, the calendar-month recall periods covered by the survey.

Matched reports include cases of reporter-physician disagreement regarding the description of the illness (dissimilarity of diagnosis, symptoms, or anatomy) but with agreement regarding the month of illness.

Underreports include cases of reporter-physician agreement regarding the description of the illness (similarity of diagnosis, symptoms, or anatomy) but with disagreement as to the month of illness.

[3] For description of matching procedures, see Belloc (*11*).

Table 44. Percentage distribution of persons in the California Health Survey and in its Post Enumeration Survey by original respondent type: California Health Survey, April 1954–March 1955; Post Enumeration Survey, July 1954–April 1955

Original respondent type	California Health Survey	Post Enumeration Survey [1] [2]
Total	100	100
Adult reporters	45	46
Children	32	32
Adult nonreporters	23	22
Measure of sample size	*100*	*100*

[1] In PES households, half the adult reporters and children were selected for reinterview. Figures are weighted inversely as the within-household sampling rates.

[2] Excludes persons found on reinterview to have been underreported or overreported. See table D-1.

respondents for children, in order to examine the stability of original interview morbidity reports. Any discrepancies between the original interview and the reinterview were discussed with the respondent, and the "correct" response determined. A more detailed discussion of the reinterview procedures appears later in this section. Beginning with the 12th weekly subsample and continuing for the duration of the California Health Survey, one-twelfth of the sample was selected for reinterview. In every PES sample household, a supervisor conducted a reinterview for all adult nonreporters and for one-half the other household members—adult reporters and children. For all adults, the person himself was interviewed and asked only about himself. Twenty percent of the children had reinterview respondents different from their original interview respondents.

The PES included a check to determine the proportions of persons erroneously included in or excluded from the California Health Survey sample. Such overreported and underreported persons are excluded from the data appearing in ensuing portions of this section.

In our subsequent discussions and tables we shall often refer to "all persons," consisting of the combination of the three original interview respondent types. Since all adult nonreporters, but only half the adult reporters and children were selected for reinterview, figures for "all persons" are weighted inversely as the within-household sampling rates.

Before turning to materials on response variability and the bias of respondent differences, it is necessary to evaluate the quality of the reinterview itself. We shall consider below some findings which aid in this evaluation.

Evaluation of the Reinterview

RELATIVE PROPORTIONS OF RESPONDENT TYPES. A percentage distribution of the types of respondents in the California Health Survey is shown in table 44. Forty-five percent of the persons covered by the survey were adult reporters, while 23 percent were adult nonreporters. The sample for the Post Enumeration Survey, when properly weighted, represented approximately these same proportions of respondent types.

For every household for which an original interview was completed, the interviewer entered on the face of the questionnaire the best time to call in the event that a return visit to the household became necessary. This information was used by the supervisors in planning calls for the Post Enumeration Survey. The average number of calls per person in the Post Enumeration Survey was 1.6, the same as the average per person in the original interview. The average number of reinterview calls for adult nonreporters was the same as that for adult reporters, 1.7, while the reinterviews of respondents for children averaged 1.4 calls.

Table 45. Percentage distribution of persons eligible for reinterview by interval between original interview and reinterview, according to original respondent type: California Health Survey PES, July 1954–April 1955

(Persons found on reinterview to have been underreported or overreported are excluded. See table D-1)

Number of weeks between original interview and reinterview	Original respondent type			
	All eligible persons [1]	Adult reporter	Nonreporter	
			Child	Adult
Total	100	100	100	100
1 or less	24	24	23	24
1–2	46	46	47	45
2–3	17	16	17	18
3–4	4	3	6	4
More than 4	9	11	7	8
Measure of sample size	*100*	*38*	*27*	*36*

[1] In PES households, half the adult reporters and children were selected for reinterview. Figures are weighted inversely as the within-household sampling rates.

INTERVAL BETWEEN ORIGINAL INTERVIEW AND REINTERVIEW. Instructions to the supervisors emphasized the importance of conducting the reinterview within as short a time as possible of the date of the original interview. They specified that every effort should be made to complete the reinterview within a week of the date of the original interview, lest memory biases of the respondent make the quality of the illness data obtained on the reinterview poorer than that of the data obtained on the original interview.

As shown in table 45, almost a quarter of the reinterviews were completed within a week of the original interview and about 70 percent within 2 weeks. Although part of the delay in obtaining reinterviews was caused by difficulties in finding the designated persons at home, other duties often prevented the supervisors from obtaining reinterviews as quickly as desirable.

Some indication of changes in the quality of the reinterviewing process as the interval between the original interview and the reinterview lengthened may be found in table 46. In that table net increases in selected morbidity rates for reinterviews conducted within 2 weeks of the original interview are compared with net increases for reinterviews conducted more than 2 weeks after the original interview. Since households were not randomly assigned a date for reinterview, we do not have experimental evidence that the interval between the date of the original interview and the reinterview affects the yield. However, we can examine information on health status as reported on the original interview, as some indication of the original similarity of the two groups. While the proportions of total conditions reported in the two groups are about the same, the incidence of illness at original interview for persons reinterviewed 2 weeks or less from the original interview is consistently lower than the incidence of illness for persons reinterviewed more than 2 weeks after the original interview. For children for whom reinterviews were conducted early, the percentage increase in incidence of illness is greater than for children for whom reinterviews were conducted late. This is consistent with the hypothesis that led to an analysis of the table. For other respondent types early reinterviewing apparently did not result in a substantially greater number of illnesses being reported. Indeed, for chronic conditions not causing illness in the last 4 weeks, it appears that late interviews are more productive than early ones, possibly because respondents are more cooperative when a longer time interval has occurred between the original interview and reinterview.

REINTERVIEWER PERFORMANCE. No systematic checks were made on the supervisors in their conduct of the reinterviews. Consequently, no direct measures of the adequacy of reinterviewing are available. There are two aspects of reinterviewer performance which bear indirectly on the adequacy of reinterviewing. The first has to do with the effect of using two somewhat different reinterview procedures, an "independent" and a "dependent" procedure. The second aspect relates to differences among reinterviewers, with respect both to the quality of morbidity data and to the quality of information on personal characteristics.

In order to evaluate the extent to which reinterviewers might be affected by advance knowledge of the information obtained on the original interview, the households selected for reinterview were split into two subsamples, one scheduled for an independent reinterview procedure, the other for a dependent procedure.

For the independent reinterview subsample, a blank reinterview questionnaire was used and all detailed questions were asked again. Following the listing of responses to the condition-recall questions, entries were made on table I of the questionnaire for each illness and chronic condition reported. On completion of this independent reinterview, an envelope containing a transcript of the original interview questionnaire was opened, and the reinterview information was compared with the original responses.

Figure 12 demonstrates the results of each step in the independent procedure. The reinterviewers identified three types of conditions resulting from a comparison of the two questionnaires:

Independent overreports: Conditions reported on the original interview but not on the independent reinterview.

Independent matches: Conditions reported on both questionnaires.

Table 46. Selected measures of morbidity, including incidence of illness per 100 persons per month by illness type and severity, at original interview, with net differences between reconciled reinterview and original interview rates as a percentage of original interview rates, for intervals between original interview and reinterview, by original respondent type: California Health Survey PES, July 1954–March 1955

(Persons found on reinterview to have been underreported or overreported are excluded. See table D-1)

Number of weeks between original interview and reinterview	Total conditions	Monthly prevalence of illness per 100 persons											Chronic condition causing no illness in 4-week recall period
		Total	Incidence of illness per 100 persons per month									Didn't start in 4-week recall period	
			Total illness			Acute illness			Chronic illness				
			Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.		
ALL PERSONS [1]													
Original interview rate:													
2 or less	129	91	43	18	25	25	12	13	18	6	12	48	37
More than 2	132	99	58	23	34	34	14	20	23	10	14	42	33
Net reinterview-original interview differences (percent):													
2 or less	31	29	29	37	23	25	22	28	34	66	18	30	34
More than 2	35	31	31	27	33	14	20	10	54	36	67	32	48
ADULT REPORTERS													
Original interview rate:													
2 or less	175	121	50	19	30	26	10	15	24	9	15	71	54
More than 2	166	111	56	14	42	26	4	22	30	10	20	55	55
Net reinterview-original interview differences (percent):													
2 or less	18	16	12	8	14	9	6	11	15	11	17	19	23
More than 2	33	35	46	33	50	24	–20	31	65	54	70	25	29
CHILDREN													
Original interview rate:													
2 or less	71	56	36	22	14	26	18	8	10	4	6	20	16
More than 2	109	98	71	42	28	53	32	22	17	11	7	27	11
Net reinterview-original interview differences (percent):													
2 or less	45	41	55	55	55	48	33	82	73	162	21	16	59
More than 2	17	11	6	26	–23	4	28	–30	12	20	—	24	70
ADULT NONREPORTERS													
Original interview rate:													
2 or less	116	82	39	11	28	24	8	16	15	3	13	43	34
More than 2	98	76	42	17	25	24	9	15	18	8	10	35	21
Net reinterview-original interview differences (percent):													
2 or less	59	60	39	90	20	25	30	22	61	262	16	79	56
More than 2	71	55	47	19	66	27	18	32	64	20	115	64	130

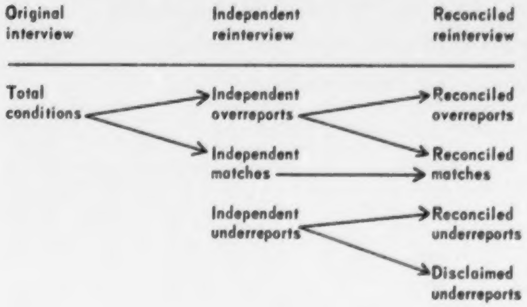
[1] In PES households, half the adult reporters and children were selected for reinterview. Figures are weighted inversely as the within-household sampling rates.

NOTE: Measure of sample size for morbidity rates may be obtained from table 45, by multiplying the measure of sample size for a given respondent type by the combined percentage for the appropriate group of intervals in the body of table 45 and dividing the product by 100.

Measure of sample size for each net difference may be obtained by multiplying the corresponding rate by the appropriate value shown in the following tabulation:

Number of weeks between original interview and reinterview	*All persons*	*Adult reporters*	*Nonreporters*	
			Child	*Adult*
2 or less	*0.554*	*0.214*	*0.150*	*0.198*
More than 2	*.238*	*.087*	*.063*	*.087*

Figure 12. Results of independent reinterview procedure: California Health Survey PES



Independent underreports: Conditions reported on the independent reinterview but not on the original interview.

After the reinterviewer discussed with the reinterview respondent each independent overreport and underreport, the following reconciled classifications resulted:

Reconciled overreports: Independent overreports which the respondent confirmed should not have been reported on the original interview.

Reconciled matches: Independent matches plus those independent overreports which the respondent recalled after discussion, and agreed should have been reported on the original interview.

Reconciled underreports: Independent underreports which the respondent confirmed should have been reported on the original interview.

Disclaimed underreports: Independent underreports which the respondent, after discussion, agreed should not have been reported on the original interview.

For each independent matched condition, the entries describing the type of condition in table I of the original questionnaire were compared with the corresponding entries on the reinterview questionnaire. The reinterviewer discussed each discrepancy with the respondent, who decided which entry was "correct."

At the reconciled reinterview, the reinterviewer recorded the respondent's reasons for the occurrence of underreports and overreports (including those independent overreports which became reconciled matches after comparison with the original interview responses).

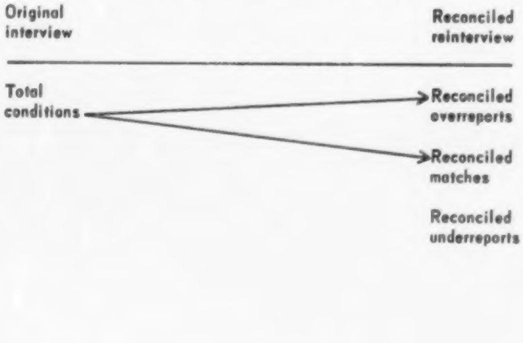
For the dependent reinterview subsample, the reinterviewer asked again the condition-recall questions and then compared the illnesses and chronic conditions reported in table I of a transcribed copy of the original interview questionnaire with those reported in response to the reinterview condition-recall questions (see appendix E for copies of the original interview and reinterview questionnaires). Figure 13 shows the condition classifications resulting from comparison of the original interview table I entries with the responses to the dependent reinterview questions about the existence of conditions. The reasons for underreports and overreports were obtained. The reinterviewer then completed the entries in table I about the characteristics of each underreported condition, and for matched conditions he asked again the questions in table I about characteristics of the condition. Any differences were reported to the respondent, who made a decision as to the "correct" entry.

Thus, in both types of reinterviews the questions about the existence of morbidity conditions (Q. 8–17) were asked independently. In the dependent reinterview the table I questions about the characteristics of each condition were asked while the reinterviewer looked at the original interview questionnaire. In the independent reinterview the reinterviewer did not have the original interview questionnaire before him when asking the table I questions about the characteristics of each condition.

These procedures resulted not only in information on differences between the original interview and reinterview, but presumably the final, reconciled reinterview responses for both independent and dependent procedures represented a "better" answer than could have been obtained from either the original interview or independent reinterview alone.

A prime purpose for comparing an independent with a dependent procedure was to see if advance knowledge of the contents of the original questionnaire influenced the quality of the reinterviewing. The dependent procedure was less time consuming; therefore, if no difference in reinterviewing quality was found

Figure 13. Results of dependent reinterview procedure: California Health Survey PES



between it and the independent procedure, its use would be preferable.

In table 47 the dependent and independent reinterview subsamples are contrasted in terms of the relative yield of total morbidity conditions (including both chronic conditions and illnesses) for the three original interview respondent types. For adult reporters there is a greater net increase in total conditions for the dependent than for the independent subsample. For adult nonreporters the situation is reversed, the net increases being greater for the independent than for the dependent subsamples. (The net differences for children are difficult to interpret, since the original interview total condition rate in the dependent subsample is only two-thirds that in the independent subsample.)

Although the results regarding net differences are equivocal, a clearer distinction between the two procedures emerges when one examines shifts in the classification of matched conditions (lower portion of table 47). For adult reporters and adult nonreporters, approximately twice as many independent as dependent subsample matched conditions had a major classification shift as a result of disagreement regarding whether or not the condition caused illness,

Table 47. Total conditions per 100 persons, for dependent and independent reinterview subsamples, at reconciled reinterview and at original interview, with net differences, matched reports, overreports, and underreports as a percentage of original interview reports, and percentage of matched reports with disagreement as to classification, by original respondent type: California Health Survey PES, July 1954–March 1955

(Persons found on reinterview to have been underreported or overreported are excluded. See table D-1)

Results of comparison	Original respondent type, by type of reinterview subsample							
	All persons [1]		Adult reporter		Nonreporter			
					Child		Adult	
	Dependent	Independent	Dependent	Independent	Dependent	Independent	Dependent	Independent
	Total conditions per 100 persons							
Reconciled reinterview	173	170	224	195	97	129	184	171
Original interview	127	134	174	171	68	102	119	99
Net difference (percent)	36	27	29	14	43	26	55	73
	Percent of original interview total conditions							
Original interview total conditions	100	100	100	100	100	100	100	100
Matched with reconciled reinterview	98	96	99	96	97	100	94	89
Overreports—reported on original interview but not on reconciled reinterview	2	4	1	4	3	—	6	11
Underreports—not on original interview but reported on reconciled reinterview	39	31	30	18	46	26	61	84
	Percent of matched reports							
Disagreement as to classification [2]	4.0	7.0	3.6	7.4	2.7	2.9	6.7	12.6
Measure of sample size:								
Total conditions	*56*	*44*	*21*	*17*	*15*	*11*	*20*	*16*
Net differences and other percentages of original interview conditions	*55*	*45*	*29*	*23*	*8.1*	*9.3*	*18*	*13*

[1] In PES households, half the adult reporters and children were selected for reinterview. Figures are weighted inversely as the within-household sampling rates.

[2] Total matched conditions with disagreement between the reconciled reinterview and the original interview regarding the three mutually exclusive classifications: (*a*) illness starting in the 4-week recall period, (*b*) illness not starting in the 4-week recall period, (*c*) chronic condition causing no illness in the 4-week recall period.

when the illness started, and whether the condition was chronic or acute. Thus, the dependent reinterview procedure resulted in less accurate recording at reinterview of the detailed characteristics of reconciled matched conditions.

It was originally thought that if the quality of the reinterviewing improved with time, then, with all other factors held constant, the proportions of underreported conditions should increase. In table 48 the proportions of underreported conditions in the first 15, the second 12, and the third 14 weeks of the Post Enumeration Survey are contrasted. This has been done for administrative areas I and II separately, because the doubling of a substantial proportion of the sample in area I during weeks 27–38 imposed an additional burden on the supervisors conducting the reinterviews in that area. (Additional new interviewers were recruited for work during weeks 27–38; some reinterviewing during those weeks was assigned to two of the better area I interviewers who had worked during weeks 1–26.)

Table 48 indicates that area I reinterviewers obtained about 17 percent reconciled underreports, conditions which had not been reported at the original interview. This proportion did not vary significantly in area I among each of the three time periods examined, including the time of the doubled sample.

Administrative area II presents a different story. A much higher proportion of reconciled underreports (86 percent) was obtained in the first 15 weeks in area II than in area I. The proportion of underreports in area II declined to 48 percent in weeks 27–38, and to 41 percent in weeks 39–52. One might consider the relatively greater proportion of underreported conditions in area II over area I during the first 15 weeks as an indication that the original interviewers in area II did a less adequate job. It should follow then that the original interview condition rates for these first 15 weeks would be lower in area II than in area I. As this is not the case, we believe the higher proportion of underreported conditions in area II is the

Table 48. Total conditions per 100 persons at reconciled reinterview and at original interview, with net differences, matched, overreported, and underreported conditions as a percentage of original interview total conditions, for administrative areas by interviewing periods in survey year: California Health Survey PES, July 1954–March 1955

(Persons found on reinterview to have been underreported or overreported are excluded. See table D-1)

Results of comparison	Administrative area I				Administrative area II			
	Total	Weeks scheduled for original interview			Total	Weeks scheduled for original interview		
		12-26	27-38	39-52		12-26	27-38	39-52
	Total conditions per 100 persons [1]							
Reconciled reinterview	135	140	138	127	223	214	262	189
Original interview	119	124	118	113	147	117	182	135
Net difference (percent)	14	13	17	12	52	82	44	39
	Percent of original interview total conditions							
Original interview total conditions	100	100	100	100	100	100	100	100
Matched with reconciled reinterview	97	97	99	96	97	96	96	98
Overreports--reported on original interview but not on reconciled reinterview	3	3	1	4	3	4	4	2
Underreports—not on original interview but reported on reconciled reinterview	17	16	18	16	55	86	48	41
Measure of sample size:								
Total conditions	*57*	*21*	*19*	*18*	*42*	*13*	*16*	*14*
Net difference and other percentages of original interview conditions	*52*	*20*	*17*	*15*	*48*	*11*	*22*	*14*

[1] In PES households, half the adult reporters and children were selected for reinterview. Figures are weighted inversely as the within-household sampling rates.

Table 49. Total conditions per 100 persons at original interview, with net differences between reconciled reinterview and original interview conditions, and underreports as a percentage of original interview conditions, and percentage of persons with disagreement regarding selected personal data, for administrative areas by reinterviewer: California Health Survey PES, July 1954–March 1955

(Persons found on reinterview to have been underreported or overreported are excluded. See table D-1)

Results of comparison	Administrative area I					Administrative area II		
	Total	Reinterviewer				Total	Reinterviewer	
		A	B	C	D		E	F
TOTAL CONDITIONS								
Total conditions per 100 persons [1] at original interview	119	120	128	117	108	147	132	156
Net reconciled reinterview-original interview differences (percent)	14	16	16	8	13	52	73	42
Underreports—not on original interview but reported on reconciled reinterview (percent)	17	18	17	15	17	55	76	45
PERSONAL DATA								
Percent of persons with disagreement between original interview and reconciled reinterview reports regarding—								
Usual activity [2]	2. 8	1. 1	5. 5	2. 5	2. 0	3. 6	4. 9	2. 9
Veteran status [3]	1. 8	2. 4	2. 1	2. 6	. 4	2. 0	4. 2	. 8
Health insurance coverage [4]	11. 0	13. 0	10. 0	13. 0	6. 0	19. 0	17. 0	20. 0
Family income [5]	17. 0	24. 0	16. 0	4. 0	13. 0	23. 0	24. 0	22. 0
Measure of sample size:								
Total condition rates and percent of persons with disagreement	*57*	*20*	*15*	*8*	*13*	*42*	*15*	*27*
Net differences and underreports	*52*	*18*	*15*	*7*	*11*	*48*	*15*	*32*

[1] In PES households, half the adult reporters and children were selected for reinterview. Figures are weighted inversely as the within-household sampling rates.

[2] Seven categories for usual activity during 4-week recall period: (*a*) work, (*b*) keep house, (*c*) go to school, (*d*) unable to work because of long-term disability, (*e*) usually works, but temporarily not working (unemployed, on vacation, etc.), (*f*) preschool or retired, (*g*) not ascertained.

[3] Eleven categories for veteran status: (*a*) never served, (*b*) Korean War (only), (*c*) World War II (only), (*d*) World War I (only), (*e*) Korean and World War II, (*f*) Korean, World War II, and World War I, (*g*) World War II and World War I; other service, (*h*) with World War II, (*i*) without World War II, (*j*) peacetime service only, (*k*) not ascertained.

[4] Six categories for health insurance coverage: (*a*) no health insurance, (*b*) doctor's care, (*c*) hospitalization and surgery, (*d*) hospitalization only, (*e*) surgery only, (*f*) coverage not ascertained.

[5] Nine categories for family income in preceding calendar-year: (*a*) under $1,000, (*b*) $1,000–$1,999, (*c*) $2,000–$2,999, (*d*) $3,000–$3,999, (*e*) $4,000–$4,999, (*f*) $5,000–$5,999, (*g*) $6,000–$6,999, (*h*) $7,000 and over, (*i*) not ascertained.

result of more adequate reinterviewing in area II. The high volume of underreported conditions during the early weeks of the Post Enumeration Survey was reported to the interviewers. This feedback probably resulted in a lower proportion of underreported conditions in administrative area II in later weeks.

If the reinterviewing in administrative area I had been as effective as that in area II, the relative differences between the original and reinterviews might have been much higher.

Table 49 presents additional evidence which suggests differences in the quality of the reinterviewing. Inspection of the proportion of underreported conditions reveals wide differences among reinterviewers. Reinterviewer C obtained only 15 percent underreports, while reinterviewer E obtained 76 percent underreports. A possible explanation for these differences is that the quality of reinterviewing was constant and that the differences among reinterviewers may be attributed to differences in the quality of the original interview information. Personal characteristics might be expected to be much less subject to interviewer effects than morbidity data. In table 49 the percentage of persons with disagreement between the original interview and reconciled reinterview classifications of selected personal characteristics is given for each reinterviewer. In general, the percentage disagreement is high for those reinterviewers for whom the proportions of underreported conditions also is high. This finding provides further indirect evidence of differences among reinterviewers.[7]

In administrative area II, where only two reinterviewers completed all the work on the Post Enumeration Survey, it was possible to find a number of original interviewers, part of whose work was checked by one reinterviewer and the balance by the other reinterviewer. Table 50 shows the relative volume of underreports obtained by seven interviewers who had different parts of their work checked by each reinterviewer. For six of the seven original interviewers, the relative volume of underreports obtained by reinterviewer E exceeds that obtained by reinterviewer F. This finding provides additional evidence of variations among reinterviewers in the quality of the reinterviews.

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[7] This variability among reinterviewers was reviewed with the reinterviewers and with the Census Bureau regional office supervisory staff during the course of the survey.

Considering factors which could affect the yield on the reinterview, we have found that, although many reinterviews were taken more than 2 weeks after the date of the original interview, there did not seem to be much difference in the relative yield of conditions reported at reinterviews conducted "early" compared with those conducted "late." We have also found that independent reinterview procedures produced more "unbiased" recording of the characteristics of those morbidity conditions which had previously been reported at original interview than did dependent procedures. A variety of indirect (nonexperimental) evidence points to a substantial variation in the quality of the reinterviewing, both with regard to the number of additional conditions reported and with respect to detailed information about the conditions. (Experimental evidence from the San Jose Survey presented in section 7 as well as indirect evidence from the California Health Survey suggests significant variations among original interviewers as well.) Of all the factors mentioned, perhaps the most important is the wide variation among reinterviewers. Had the reinterviewing quality been uniformly high, it seems certain that the differences between original interview and reinterview morbidity reporting would have been much larger.

Although the following evaluation of the bias of respondent differences must be tempered by some of the factors mentioned above, it seems reasonable to assume that the major findings regarding respondent differences would have

Table 50. Total conditions per 100 persons at original interview, with net differences between reconciled reinterview and original interview conditons, and underreports as a percentage of original interview conditions, by original interviewer and reinterviewer, administrative area II: California Health Survey PES, July 1954–March 1955

(Includes only those interviewers part of whose work was checked by one reinterviewer and the balance by the other reinterviewer. Persons found on reinterview to have been underreported or overreported are excluded. See table D-1)

Results of comparison	Original interviewer						
	3	5	6	7	8	9	10
Total conditions per 100 persons [1] at original interview:							
Reinterviewer E	142	206	300	144	136	63	58
Reinterviewer F	100	125	109	167	59	195	126
Net reconciled reinterview-original interview differences (percent):							
Reinterviewer E	22	38	133	55	217	111	143
Reinterviewer F	50	10	34	43	140	17	32
Underreports—not on original interview but reported on reconciled reinterview (percent):							
Reinterviewer E	30	38	133	58	230	116	143
Reinterviewer F	50	10	41	43	140	19	32
Measure of sample size:							
Total conditions:							
Interviewer E	*1.0*	*0.9*	*0.8*	*3.2*	*1.2*	*1.6*	*2.1*
Interviewer F	*.4*	*.4*	*5.8*	*2.7*	*.9*	*1.9*	*1.4*
Net differences and underreports:							
Interviewer E	*1.1*	*1.5*	*.7*	*3.5*	*1.2*	*.8*	*.9*
Interviewer F	*.3*	*.4*	*4.9*	*3.5*	*.4*	*2.9*	*1.4*

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[1] In PES households, half the adult reporters and children were selected for reinterview. Figures are weighted inversely as the within-household sampling rates.

remained the same even if the general quality of the reinterviewing had been higher.

Differences in Reported Morbidity Between Original Interviews and Reinterviews

Since the independent reinterview was conducted without reference to the original interview questionnaire, it is possible to differentiate the number of conditions reported at independent reinterview prior to reconciliation from the number reported at the reconciled interview. The reconciliation consisted of pointing out to the respondent discrepancies between the original interview and the independent reinterview, and the respondent's determination of the "correct" response. Before examining summary data on the differences in reported morbidity between original interviews and reinterviews, it is necessary to understand the basic data from which the summaries are derived. Table 51 relates the basic morbidity data reported by adult reporters at original interview to the same reporters' responses at independent reinterview. (This process is described in the discussion of figure 12.) The conditions reported at original interview are separated into two groups after independent reinterview. Those conditions reported on both questionnaires are identified as independent matches. The conditions reported on original interview but omitted from the independent reinterview are identified as independent overreports. The independent reinterview produced a third group of conditions, independent underreports, conditions reported at independent reinterview that were not reported at original interview.

In table 51, the independent matches are categorized according to the way they were classified by the adult reporter at original interview and again at reconciled reinterview. (It would have been desirable to present the independent reinterview classification of matched conditions, but this could not be obtained from the reinterview questionnaires. Because of the nature of the reconciliation process, the use of the reconciled reinterview classification increases the proportion of matched conditions appearing on the diagonal of table 51.) It is important to note that disagreement in the classification of matched conditions is indicated by cells appearing off the diagonal entries in table 51.

The totals of the various classes of conditions reported at original interview, contained in the bottom row of table 51, are obtained by adding the independent overreports to the column sum for independent matches. The totals for the various classes of conditions reported at independent reinterview, contained in the last column of table 51, are obtained by adding the independent underreports to the row sum for independent matches.

Table 52 relates the same original interview data of adult reporters to their responses at reconciled reinterview. (This process is also described in the discussion of figure 12.) The reconciled matches of table 52 consist of the independent matches of table 51 plus those independent overreports which the reporter stated were correctly reported at the original interview and should have been reported at the independent reinterview.

The reconciled overreports which remain consist of independent overreports which the reporter confirmed should not have been reported at original interview. The independent underreports of table 51 are divided in table 52 into reconciled underreports (which the reporter confirmed should have been reported at original interview) and into disclaimed underreports (which the reporter agreed, after discussion, should not have been reported on the original interview). No underreported conditions were disclaimed during the reconciliation process. Totals for the various types of original interview conditions are obtained by adding the reconciled overreports to the column sum for reconciled matches. Totals for the reconciled reinterview conditions are obtained by subtracting the disclaimed from the reconciled underreports and adding the results to the row sum for reconciled matches.

Since the data presented in tables 51 and 52 are quite extensive, some condensation seemed essential. The results of this condensation for one kind of morbidity condition, the incidence of illness by illness type and severity, are shown in table 53. In the section labeled "adult reporters," the original interview rates are derived from the bottom row of table 51 or table 52. The net percentage differences between the independent reinterview and the

Table 51. Number of independent matches, independent overreports, and independent underreports of adult reporters at original interview and at independent reinterview, classified by selected measures of morbidity, including incidence of illness by illness type and severity: California Health Survey PES, July 1954–March 1955

(Data are derived from independent reinterview subsample. Reporters found on reinterview to have been underreported or overreported are excluded. See table D-1)

Reconciled reinterview classification	Original interview classification										Total	Independent underreports [1]	Total reported at independent reinterview [2]
	Prevalence of illness in 4-week recall period												
	Incidence of illness in 4-week recall period								Didn't start in 4-week recall period	Chronic conditions causing no illness in 4-week recall period			
	Acute illness				Chronic illness								
	With activity restriction		Without activity restriction		With activity restriction		Without activity restriction						
	Med. att. A	Not med. att. B	Med. att. C	Not med. att. D	Med. att. E	Not med. att. F	Med. att. G	Not med. att. H	I	J			
Independent matches:													
A	—	1	—	—	—	—	—	—	—	—	1	—	1
B	—	3	—	—	—	—	—	—	—	—	3	1	4
C	—	—	—	—	—	—	—	—	—	—	—	1	1
D	—	—	2	23	—	—	—	1	1	—	27	4	31
E	—	—	—	—	2	—	—	1	2	—	5	—	5
F	—	—	—	—	2	6	—	—	1	—	9	—	9
G	—	—	—	—	—	—	—	2	1	1	4	4	8
H	—	—	—	1	—	3	1	27	3	—	35	5	40
I	—	—	—	—	—	1	3	—	106	8	118	16	134
J	—	—	—	—	—	—	1	—	2	67	70	31	101
Total	—	4	2	24	4	10	5	31	116	76	272	62	334
Independent overreports [3]	—	1	1	15	—	1	1	6	14	27	66	. . .	. . .
Total reported at original interview [4]	—	5	3	39	4	11	6	37	130	103	338	. . .	. . .

[1] Not on original interview but reported on independent reinterview.
[2] Independent matches plus independent underreports.
[3] Reported on original interview but not on independent reinterview.
[4] Independent matches plus independent overreports.

Table 52. Number of reconciled matches, reconciled overreports, reconciled underreports, and disclaimed underreports of adult reporters at original interview and at reconciled reinterview, classified by selected measures of morbidity, including incidence of illness by illness type and severity: California Health Survey PES, July 1954–March 1955

(Data are derived from independent reinterview subsample. Reporters found on reinterview to have been underreported or overreported are excluded. See table D-1)

Reconciled reinterview classification	Original interview classification										Total	Reconciled under-reports [1]	Disclaimed under-reports [2]	Total reported at reconciled reinterview [3]
	Prevalence of illness in 4-week recall period									Chronic conditions causing no illness in 4-week recall period				
	Incidence of illness in 4-week recall period								Didn't start in 4-week recall period					
	Acute illness				Chronic illness									
	With activity restriction		Without activity restriction		With activity restriction		Without activity restriction							
	Med. att.	Not med. att.	Med. att.	Not med. att.	Med. att.	Not med. att.	Med. att.	Not med. att.						
	A	B	C	D	E	F	G	H	I	J				
Reconciled matches:														
A	—	1	—	—	—	—	—	—	—	—	1	—	—	1
B	—	3	—	—	—	—	—	—	—	—	3	1	—	4
C	—	—	1	—	—	—	—	—	—	—	1	1	—	2
D	—	—	2	36	—	—	—	1	1	—	40	4	—	44
E	—	—	—	—	2	—	—	1	2	—	5	—	—	5
F	—	—	—	—	2	7	—	—	1	—	10	—	—	10
G	—	—	—	—	—	—	1	3	1	1	6	4	—	10
H	—	—	—	1	—	3	1	31	3	—	39	5	—	44
I	—	—	—	—	—	1	3	—	115	8	127	16	—	143
J	—	—	—	—	—	—	1	—	2	90	93	31	—	124
Total	—	4	3	37	4	11	6	36	125	99	325	62	—	387
Reconciled overreports [4]	—	1	—	2	—	—	—	1	5	4	13	. . .	. . .	. . .
Total reported at original interview [5]	—	5	3	39	4	11	6	37	130	103	338	. . .	. . .	. . .

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[1] Not on original interview but reported on reconciled reinterview.
[2] Reported on independent reinterview but denied on independent reinterview.
[3] Reconciled matches plus reconciled underreports.
[4] Reported on original interview but not on reconciled reinterview.
[5] Reconciled matches plus reconciled overreports.

Table 53. Incidence of illness per 100 persons per month at original interview, compared with independent reinterviews and ensuing reconciled reinterviews, with net differences between rates, matched, overreported, and underreported illnesses as a percentage of original interview illnesses, by illness type and severity and original respondent type: California Health Survey PES, July 1954–March 1955

(Data are derived from independent reinterview subsample. Persons found on reinterview to have been underreported or overreported are excluded. See table D-1)

Results of comparison of original interviews with independent reinterviews [1] and ensuing reconciled reinterviews	Incidence of illness								
	Total illness			Acute illness			Chronic illness		
	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.
ALL PERSONS [2]									
Original interview rate	52	20	31	29	11	18	23	9	14
Net difference between rates (percent):									
Independent reinterview-original interview	3	21	-9	-8	-5	-9	16	54	-8
Reconciled reinterview-original interview	22	41	9	17	25	14	26	62	3
Total reported at original interview (percent)	100	100	100	100	100	100	100	100	100
Matched with—									
Independent reinterview	76	80	74	67	70	65	88	93	85
Reconciled reinterview	95	98	93	93	97	90	98	100	97
Overreports—reported on original interview but not on—									
Independent reinterview	24	20	26	33	30	35	12	7	15
Reconciled reinterview	5	2	7	7	3	10	2	—	3
Underreports (percent)—not on original interview but reported on—									
Independent reinterview	25	24	25	24	19	28	26	32	22
Reconciled reinterview	25	24	25	24	19	28	26	32	22
ADULT REPORTERS									
Original interview rate	53	15	38	24	4	20	29	11	19
Net difference between rates (percent):									
Independent reinterview-original interview	-6	-3	-7	-21	-25	-21	7	5	8
Reconciled reinterview-original interview	14	10	16	9	-12	13	19	19	19
Total reported at original interview (percent)	100	100	100	100	100	100	100	100	100
Matched with—									
Independent reinterview	76	86	72	64	75	62	86	90	84
Reconciled reinterview	96	97	96	94	88	95	98	100	97
Overreports—reported on original interview but not on—									
Independent reinterview	24	14	28	36	25	38	14	10	16
Reconciled reinterview	4	3	4	6	12	5	2	—	3
Underreports (percent)—not on original interview, but reported on—									
Independent reinterview	14	21	12	13	25	10	16	19	14
Reconciled reinterview	14	21	12	13	25	10	16	19	14
CHILDREN									
Original interview rate	59	34	25	41	25	16	18	9	9
Net difference between rates (percent):									
Independent reinterview-original interview	1	27	-33	-6	-3	-10	17	108	-75
Reconciled reinterview-original interview	21	53	-24	22	33	5	17	108	-75
Total reported at original interview (percent)	100	100	100	100	100	100	100	100	100
Matched with—									
Independent reinterview	81	76	88	72	67	81	100	100	100
Reconciled reinterview	100	100	100	100	100	100	100	100	100
Overreports—reported on original interview but not on—									
Independent reinterview	19	24	12	28	33	19	—	—	—
Reconciled reinterview	—	—	—	—	—	—	—	—	—
Underreports (percent)—not on original interview, but reported on—									
Independent reinterview	19	16	24	20	15	29	17	17	17
Reconciled reinterview	19	16	24	20	15	29	17	17	17

See footnotes at end of table.

Table 53. Incidence of illness per 100 persons per month at original interview, compared with independent reinterviews and ensuing reconciled reinterviews, with net differences between rates, matched, overreported, and underreported illnesses as a percentage of original interview illnesses, by illness type and severity and original respondent type: California Health Survey PES, July 1954–March 1955—Continued

(Data are derived from independent reinterview subsample. Persons found on reinterview to have been underreported or overreported are excluded. See table D-1)

Results of comparison of original interviews with independent reinterviews [1] and ensuing reconciled reinterviews	Incidence of illness								
	Total illness			Acute illness			Chronic illness		
	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.
ADULT NONREPORTERS									
Original interview rate	40	13	27	23	8	15	16	5	11
Net difference between rates (percent):									
Independent reinterview-original interview	27	56	16	16	7	21	48	130	10
Reconciled reinterview-original interview	45	68	34	30	27	31	68	130	38
Total reported at original interview (percent)	100	100	100	100	100	100	100	100	100
Matched with—									
Independent reinterview	68	84	60	61	80	52	77	90	71
Reconciled reinterview	83	96	76	73	93	62	97	100	95
Overreports—reported on original interview but not on—									
Independent reinterview	32	16	40	39	20	48	23	10	29
Reconciled reinterview	17	4	24	27	7	38	3	—	5
Underreports (percent)—not on original interview but reported on—									
Independent reinterview	67	64	68	59	27	76	77	120	57
Reconciled reinterview	67	64	68	59	27	76	77	120	57
Measure of sample size for net differences and other percentages of original interview reports: [3]									
All persons	*18*	*7.0*	*11*	*9.9*	*3.9*	*6.0*	*7.9*	*3.1*	*4.8*
Adult reporters	*7.1*	*2.0*	*5.2*	*3.2*	*.5*	*2.7*	*3.9*	*1.4*	*2.5*
Children	*5.3*	*3.1*	*2.2*	*3.7*	*2.2*	*1.4*	*1.6*	*.8*	*.8*
Adult nonreporters	*5.1*	*1.7*	*3.4*	*3.0*	*1.0*	*2.0*	*2.1*	*.7*	*1.4*

[1] Data are based only on conditions reported at independent reinterview, but the classification by type of condition, starting date, and type and severity of illness is from the reconciled reinterview.

[2] In PES households, half the adult reporters and children were selected for reinterview. Figures are weighted inversely as the within-household sampling rates.

[3] For incidence rates, the measure of sample size is: all persons, 44; adult reporters, 17; children, 11; adult nonreporters, 16.

original interview are obtained by subtracting the "total reported at original interview" in table 51 from the corresponding categories of the "total reported at independent reinterview" in table 51, and by expressing these net differences as a percentage of the total reported in each classification at original interview. Similar computations from table 52 produce the net percentage differences (shown in table 53) between the reconciled reinterview and the original interview. In the adult reporters section of table 53 the remaining rows express six of the groups [7a] of reinterview conditions outlined in figure 12 as a percentage of the number of conditions reported at original interview. These percentages, derived from the data in tables 51 and 52, provide a measure of instability in the reporting of the existence of conditions. If there were no shifts in the classification of matched conditions, the percentage of independent underreports minus the percentage of independent overreports should equal the independent reinterview-original interview net differences (and similarly for reconciled underreports, reconciled overreports, and reconciled reinterview-original interview net differences). Because of the shifts in classification of matched conditions, the relationship described above holds only for total morbidity conditions (as in table 48, for example).

Having presented a detailed example of the differences between original interviews and reinterviews, we shall turn now to a summary

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[7a] Disclaimed underreports are not shown in table 53 or subsequent tables because none were found.

Table 54. Days of restricted activity and days of bed disability per 100 persons per month, associated with illness reported at original interview, by type of illness, and chronic conditions per 100 persons at original interview, by level of severity, compared with independent reinterviews and ensuing reconciled reinterviews, with net differences between rates, matched reports, overreports, and underreports as a percentage of original interview reports, by original respondent type: California Health Survey PES, July 1954–March 1955

(Data are derived from independent reinterview subsample. Persons found on reinterview to have been underreported or overreported are excluded. See table D-1)

Results of comparison of original interviews with independent reinterviews [1] and ensuing reconciled reinterviews	Restricted-activity days			Bed-disability days			Chronic conditions, by level of severity [3]			
	Total illness	Acute illness	Chronic illness	Total illness	Acute illness	Chronic illness	All levels	Sub-stantial	Mod-erate	No reported effects
ALL PERSONS [2]										
Original interview rate	191	51	140	81	15	66	100	54	29	17
Net difference between rates (percent):										
Independent reinterview-original interview	9	−11	16	−3	−2	−3	19	12	33	18
Reconciled reinterview-original interview	13	3	17	1	11	−1	31	18	47	42
Total reported at original interview (percent)	100	100	100	100	100	100	100	100	100	100
Matched with—										
Independent reinterview	90	84	92	88	86	89	85	91	82	72
Reconciled reinterview	95	98	94	92	98	90	97	98	96	95
Overreports—reported on original interview but not on—										
Independent reinterview	10	16	8	12	14	11	15	9	18	28
Reconciled reinterview	5	2	6	8	2	10	3	2	4	5
Underreports (percent)—not on original interview but reported on—										
Independent reinterview	11	14	9	14	23	12	33	23	42	51
Reconciled reinterview	11	14	9	14	23	12	33	23	42	51
ADULT REPORTERS										
Original interview rate	260	31	228	128	6	122	145	75	40	30
Net difference between rates (percent):										
Independent reinterview-original interview	−1	−32	3	−18	—	−19	2	−1	16	−8
Reconciled reinterview-original interview	−1	−32	3	−18	—	−19	16	4	35	20
Total reported at original interview (percent)	100	100	100	100	100	100	100	100	100	100
Matched with—										
Independent reinterview	92	98	91	89	92	88	83	91	80	66
Reconciled reinterview	93	98	92	89	92	88	97	97	98	95
Overreports—reported on original interview but not on—										
Independent reinterview	8	2	9	11	8	12	17	9	20	34
Reconciled reinterview	7	2	8	11	8	12	3	3	2	5
Underreports (percent)—not on original interview but reported on—										
Independent reinterview	5	15	3	4	75	—	19	11	26	31
Reconciled reinterview	5	15	3	4	75	—	19	11	26	31
CHILDREN										
Original interview rate	143	97	46	32	29	4	52	31	17	4
Net difference between rates (percent):										
Independent reinterview-original interview	4	−2	18	21	8	120	33	17	35	160
Reconciled reinterview-original interview	18	18	18	30	18	120	36	22	35	160
Total reported at original interview (percent)	100	100	100	100	100	100	100	100	100	100
Matched with—										
Independent reinterview	86	80	100	91	89	100	97	95	100	100
Reconciled reinterview	100	100	100	100	100	100	100	100	100	100
Overreports—reported on original interview but not on—										
Independent reinterview	14	20	—	9	11	—	3	5	—	—
Reconciled reinterview	—	—	—	—	—	—	—	—	—	—

See footnotes at end of table.

Table 54. Days of restricted activity and days of bed disability per 100 persons per month, associated with illness reported at original interview, by type of illness, and chronic conditions per 100 persons at original interview, by level of severity, compared with independent reinterviews and ensuing reconciled reinterviews, with net differences between rates, matched reports, overreports, and underreports as a percentage of original interview reports, by original respondent type: California Health Survey PES, July 1954–March 1955—Continued

(Data are derived from independent reinterview subsample. Persons found on reinterview to have been underreported or overreported are excluded. See table D-1)

Results of comparison of original interviews with independent reinterviews [1] and ensuing reconciled reinterviews	Restricted-activity days			Bed-disability days			Chronic conditions, by level of severity [3]			
	Total illness	Acute illness	Chronic illness	Total illness	Acute illness	Chronic illness	All levels	Substantial	Moderate	No reported effects
CHILDREN—Continued										
Underreports (percent) —not on original interview but reported on—										
Independent reinterview	13	15	8	23	13	100	36	22	35	160
Reconciled reinterview	13	15	8	23	13	100	36	22	35	160
ADULT NONREPORTERS										
Original interview rate	116	29	88	52	15	37	73	40	23	10
Net difference between rates (percent):										
Independent reinterview-original interview	63	−7	85	57	−32	93	75	55	91	117
Reconciled reinterview-original interview	74	13	94	73	—	103	86	70	102	117
Total reported at original interview (percent)	100	100	100	100	100	100	100	100	100	100
Matched with—										
Independent reinterview	86	71	91	84	71	89	83	86	73	94
Reconciled reinterview	97	89	100	100	100	100	95	99	89	94
Overreports—reported on original interview but not on—										
Independent reinterview	14	29	9	16	29	11	17	14	27	6
Reconciled reinterview	3	11	—	—	—	—	5	1	11	6
Underreports (percent)—not on original interview but reported on—										
Independent reinterview	35	9	43	59	4	81	90	70	109	128
Reconciled reinterview	35	9	43	59	4	81	90	70	109	128
Measure of sample size for net differences and other percentages of original interview chronic conditions: [4]										
All persons							*34*	*18*	*10*	*5.9*
Adult reporters							*20*	*10*	*5.4*	*4.0*
Children							*4.7*	*2.8*	*1.3*	*.3*
Adult nonreporters							*9.4*	*5.2*	*3.0*	*1.2*

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[1] Data on days of restricted activity and bed disability at independent reinterview are based only on illnesses reported at independent reinterview, but the number of days associated with the illness and the illness type are from the reconciled reinterview.

Data on chronic conditions at independent reinterview are based only on conditions reported at independent reinterview, but the classification by type of condition and level of severity is from the reconciled reinterview.

[3] See footnotes 1-3, table 8 for definitions of severity levels.

[3] In PES households, half the adult reporters and children were selected for reinterview. Figures are weighted inversely as the within-household sampling rates.

[4] For chronic condition rates the measure of sample size is: all persons, 44; adult reporters, 17; children, 11; adult nonreporters, 16.

of such differences for the three respondent types and for a number of morbidity measures. We shall present first the results from the independent reinterview. This will be followed by a discussion of the effects of the reconciliation procedure.

Independent Reinterviews. In tables 53 and 54 the percentage change in selected morbidity rates resulting from the independent reinterview is shown for the three original interview respondent types. These represent differences between original interview and independent reinterview results before any discrepancies were reconciled. For all the morbidity measures employed—incidence of illness in table 53 and restricted activity, days of bed disability, and chronic conditions in table 54—the net increase for total rates is greatest for adult nonreporters, somewhat less for children, and least for adult reporters. Considering incidence of illness in the past 4 weeks, for which it might be expected that memory loss would be relatively greater at independent reinterview than at original interview, we find that for original interview adult reporters the independent reinterview rates are lower than the original interview rates. For chronic conditions, which should be little affected by memory factors, there is almost no difference between the relative volume reported by adult reporters at original interview and at independent reinterview. Thus, if one looks only at net differences between the two interview situations, the results suggest that adult reporters are fairly consistent (except for forgetting some illnesses), but that these adult reporters remember additional conditions for their children. Adult nonreporters report a substantial volume of additional chronic illnesses and chronic conditions when they are reinterviewed for themselves, suggesting that the proxy respondents for them at original interview had failed to mention many conditions.

Examination of illness incidence according to severity categories reveals a large net increase in rates between the original interview and independent reinterview for the more severe (activity-restricting or medically attended) chronic illness among children and adult nonreporters. This is partly due to illness associated with additional chronic conditions of moderate and substantial severity reported at independent reinterview. A similar increase is observed for days of disability associated with chronic illness for children and adult nonreporters. Thus, we have initial evidence of instability in the reporting of types of morbidity.

Further evidence of instability in the reporting of illness is found on examination of the proportions of underreported and overreported conditions, expressed as a percentage of the corresponding number of conditions reported at original interview. For example, consider the incidence of illness which was nonrestricting and nonmedically attended, as reported by adults who responded for themselves on the original interview and again on the reinterview. At independent reinterview 28 percent of the original interview conditions were overreports, while 12 percent were underreports (table 53). Thus, even for adult reporters reinterviewed with the same questionnaire about the same recall period, the illness statistics appear to be subject to relatively large gross errors.

For adult nonreporters the net differences are larger than for adult reporters, but so is the relative magnitude of both underreports and overreports.

As previously mentioned, one of the purposes of the Post Enumeration Survey was the measurement of the bias of respondent differences. The discussion so far has emphasized that there is a large variability in response, even for adult reporters. Reports of illness in a 4-week recall period are subject to a considerable number of influences which make it difficult to assume that the net differences are a result solely of respondent bias. Chronic conditions might be expected to show more stability. Even with chronic conditions, however, although net differences for adult reporters are close to zero, gross errors as measured by the relative volume of overreports and underreports are relatively large. Furthermore, net differences for children indicate an increase of one-third in the number of cases reported on independent reinterview, despite the fact that the person responding for children was the same in 80 percent of the cases. Again, these net differences for children were associated with substantial gross error.

RECONCILED REINTERVIEWS. In the preceding paragraphs we discussed the differences between the original interview and the independent reinterview conducted without reference to the original questionnaire. On the reconciled reinterview, where the reinterviewer questioned the respondent to determine the correct classification of independent underreports and overreports, no underreports were disclaimed by the respondent. On the other hand, a very substantial proportion of independent overreports were acknowledged by the respondent to have existed during the recall period covered by the interview. Thus, the effect of the reconciliation procedure was always to add conditions to the number already reported at the independent reinterview, never to decrease that number.

The proportions of conditions and days of disability which remained overreports after the reconciliation procedure (reconciled overreports) for the three original respondent types are given in tables 53 and 54. For all the morbidity measures—incidence of illness, days of restricted activity, days of bed disability, and chronic conditions—these proportions show a characteristic relationship to the type of original interview respondent. For children, all conditions originally reported which were omitted from the independent reinterview were confirmed at the reconciled reinterview. That is, all conditions which were overreports at independent reinterview became matched conditions during the reconciliation process.

Differentials between adult reporters and adult nonreporters with respect to the percentage of overreports remaining at reconciled reinterview vary according to the morbidity measure employed. Let us consider incidence of acute nonrestricting, nonmedically attended illness (table 53). For adult reporters, of the 38 percent of originally reported conditions which were overreports at independent reinterview all but one-eighth (5 percent of originally reported conditions) were matched by the reconciliation process. For adult nonreporters, 48 percent of such conditions were independent overreports and three-fourths of these (38 percent of originally reported conditions) remained overreports at the reconciled reinterview. However, for the more severe (activity-restricting or medically attended) acute conditions, adult nonreporters reconciled all but one-third (7 percent of originally reported conditions) of the 20 percent of overreports at independent reinterview.

For rates involving days of restricted activity and days of bed disability associated with illness, most of the independent overreports for adult nonreporters were matched by the reconciliation procedure. This implies that behavior associated with illness tends to be better remembered and also that the responses given at original interview by the proxy respondent helped the nonreporter to remember his days of disability and, therefore, the more serious illness that caused them. For "substantially severe" chronic conditions of adult nonreporters, for which 14 percent of the original reports were omitted (overreported) at independent reinterview, all but 1 percent were recalled during the reconciliation procedure and confirmed by the nonreporters as properly reported originally. They did not admit, however, that they had any of the independent overreported chronic conditions having no reported behavioral effects. All such latter independent overreports retained their classification as overreports after the reconciliation procedure.

A percentage distribution of the reasons given by the three original respondent types for failing to report at independent reinterview those conditions which had been correctly reported at original interview is given in table 55. For adult reporters, for almost half of the conditions in question the respondents on reconciled reinterview stated that they forgot to mention the condition. An additional 40 percent of the conditions were not reported before reconciliation because of unfavorable circumstances during the independent reinterview which prevented the respondents from remembering what they had reported at the original interview. For children almost 60 percent of the independent overreports subsequently matched were listed as "too minor to mention." It is to be noted that respondents for children did not name the reinterview situation as a reason, possibly because parents of children took more interest in the reinterview procedure. Original adult nonreporters stated that "forgetting" was the primary reason for their failure to report at independent reinterview conditions which had originally been reported for them by someone else.

The methods of asking reinterview respondents about reasons for differences and the criteria for establishing the adequacy of these reasons were relatively unstructured. However, these data suggest differences in the reinterview situations for the three types of original interview respondents.

Tables 53 and 54 also show the net percentage differences between the reconciled reinterview rates and the original interview rates. (The discussion of table 52 provides a background for these net differences.) Since the effect of the reconciliation procedure was to change the classification of a large proportion of independent overreports to that of matched conditions, the percentage differences between the reconciled reinterview and original interview are increased for all respondent types. For total rates in each of the various morbidity measures considered, the percentage increase between original interviews and reconciled reinterviews is greatest for original adult nonreporters.

Table 55. Percentage distribution of those original interview conditions that were overreports at independent reinterview but were matched on the ensuing reconciled reinterview, by reason for being omitted from the independent reinterview, according to original respondent type: California Health Survey PES, July 1954–March 1955

(Data are derived from independent reinterview subsample. Persons found on reinterview to have been underreported or overreported are excluded. See table D-1)

Reason for omission from independent reinterview	Original respondent type			
	All persons [1]	Adult reporter	Nonreporter	
			Child	Adult
Conditions reported at original interview that were overreports at independent reinterview but matched on reconciled reinterview	100	100	100	100
Condition too minor for reinterview respondent to mention	22	8	58	26
Reinterview respondent forgot to mention condition	41	49	11	57
Reinterview question not understood	1	—	—	9
Unfavorable circumstances at reinterview	25	40	—	—
Other reasons	4	—	16	4
Not ascertained	7	4	16	4
Measure of sample size	*6.7*	*3.6*	*1.3*	*1.6*

[1] In PES households, half the adult reporters and children were selected for reinterview. Figures are weighted inversely as the within-household sampling rates.

considerably less for children, and least for adult reporters. This relationship between percentage increase and respondent type is the same as on the independent reinterview. It may be recalled that for adult reporters the net differences between independent reinterview and original interview rates were mostly negative. At the reconciled reinterview, the rates for incidence of illness and for chronic conditions are mainly increased, illustrating the probing effect of the reconciliation procedure. As regards illnesses and chronic conditions of varying types, the situation is not easily summarized. For incident illness, the pattern varies with whether the illness is acute or chronic and with the severity of the illness. Even after reconciliation, the number of days of bed disability for adult reporters is less at reinterview than at original interview, while the days of bed disability, primarily those attributed to chronic illness, increase for both the other two respondent categories. For chronic conditions (for which one can postulate a smaller proportion of confounding factors than for illnesses) the differences are generally smaller for the substantially severe conditions than for conditions of moderate severity or for chronic conditions with no reported impact on the person's behavior.

Before examining some factors which may be associated with the differences in morbidity rates between original interviews and reinterviews, we shall combine data from the independent and dependent subsamples, since this allows more cases for analysis. As the data from the dependent subsample are based on reinterview responses after reconciliation, the analyses in the subsequent section will be directed toward explaining differences between reconciled reinterviews and original interviews. (Many of the factors applying to differences after reconciliation may apply to differences before reconciliation as well.) These net differences are included in tables 56 and 57 for incidence of illness, chronic conditions, days of restricted activity, and days of bed disability, together with the proportions of overreports and underreports remaining after the reconciliation procedure.

On the last line of each respondent-type section in tables 56 and 57 indices of the shift from the original interview classification of matched conditions are assembled for all reconciled reinterviews.[8] (Table 52 contains a detailed example of such shifts for adult reporters.) For example, in table 56 we have

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[8] For restricted-activity days, percentages are based on persons. See footnote 4 of table 57.

Table 56. Incidence of illness per 100 persons per month at original interview, with net differences between reconciled reinterview and original interview rates, overreported and underreported illnesses, as a percentage of original interview illnesses, by illness type and severity, and percentage of matched conditions with disagreement as to classification, all by original respondent type: California Health Survey PES, July 1954–March 1955

(Persons found on reinterview to have been underreported or overreported are excluded. See table D-1)

Results of comparison of original interviews with reconciled reinterviews	Incidence of illness								
	Total illness			Acute illness			Chronic illness		
	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.
ALL PERSONS [1]									
Original interview rate	47	20	27	28	13	15	19	7	12
Net reconciled reinterview-original interview differences (percent)	30	33	27	21	22	21	42	54	34
Overreports—reported on original interview, but not on reconciled reinterview (percent)	3	2	4	5	3	7	1	—	2
Underreports—not on original interview, but reported on reconciled reinterview (percent)	31	22	37	26	18	32	38	28	43
Percent of matched conditions with disagreement as to classification [2]	18	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
ADULT REPORTERS									
Original interview rate	52	18	34	26	8	17	26	9	17
Net reconciled reinterview-original interview differences (percent)	23	14	28	13	3	18	32	24	37
Overreports—reported on original interview, but not on reconciled reinterview (percent)	2	3	2	4	5	3	1	—	1
Underreports—not on original interview, but reported on reconciled reinterview (percent)	22	14	26	16	8	20	27	20	32
Percent of matched conditions with disagreement as to classification [2]	16	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
CHILDREN									
Original interview rate	46	28	18	34	22	12	12	6	6
Net reconciled reinterview-original interview differences (percent)	33	42	19	28	31	22	47	83	15
Overreports—reported on original interview, but not on reconciled reinterview (percent)	2	1	4	3	1	5	—	—	—
Underreports—not on original interview, but reported on reconciled reinterview (percent)	34	20	54	30	22	43	45	11	75
Percent of matched conditions with disagreement as to classification [2]	22	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
ADULT NONREPORTERS									
Original interview rate	40	13	27	24	8	15	16	4	12
Net reconciled reinterview-original interview differences (percent)	42	62	33	26	26	25	66	128	43
Overreports—reported on original interview, but not on reconciled reinterview (percent)	8	2	12	12	3	17	3	—	4
Underreports—not on original interview, but reported on reconciled reinterview (percent)	50	52	50	40	26	47	66	100	53
Percent of matched conditions with disagreement as to classification [2]	13	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Measure of sample size for net differences and other percentages of original interview reports: [3]									
All persons	*36*	*15*	*21*	*22*	*9.8*	*12*	*15*	*5.5*	*9.5*
Adult reporters	*15*	*5.3*	*10*	*7.7*	*2.5*	*5.2*	*7.8*	*2.8*	*5.0*
Children	*9.7*	*5.9*	*3.9*	*7.1*	*4.6*	*2.5*	*2.6*	*1.2*	*1.4*
Adult nonreporters	*11*	*3.5*	*7.7*	*6.7*	*2.3*	*4.4*	*4.6*	*1.2*	*3.3*

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[1] In PES households, half the adult reporters and children were selected for reinterview. Figures are weighted inversely as the within-household sampling rates.

[2] Matched conditions with agreement as to starting date in the 4-week recall period, but disagreement regarding eight mutually exclusive classifications involving (*a*) acute or chronic illness, (*b*) presence or absence of activity restriction, (*c*) presence or absence of medical attendance.

[3] For incidence rates, the measure of sample size is: all persons, 100; adult reporters, 38; children, 27; adult nonreporters, 36.

Table 57. Chronic conditions per 100 persons at original interview by level of severity, and days of restricted activity and days of bed disability per 100 persons per month, associated with illness reported at original interview, by type of illness, with net differences between reconciled reinterview and original interview rates, overreports and underreports as a percentage of original interview reports, and percentage of disagreement as to classification of restricted-activity days and chronic conditions, all by original respondent type: California Health Survey PES, July 1954–March 1955

(Persons found on reinterview to have been underreported or overreported are excluded. See table D–1)

Results of comparison of original interviews with reconciled reinterviews	Chronic conditions, by level of severity [1]				Restricted-activity days			Bed-disability days		
	All levels	Sub-stantial	Mod-erate	No re-ported effects	Total illness	Acute illness	Chronic illness	Total illness	Acute illness	Chronic illness
ALL PERSONS [2]										
Original interview rate	98	53	28	17	203	59	143	83	23	60
Net reconciled reinterview-original interview differences (percent)	36	23	56	42	11	6	13	7	3	9
Overreports—reported on original interview but not on reconciled reinterview (percent)	3	2	2	4	2	2	2	4	2	5
Underreports—not on original interview but reported on reconciled reinterview (percent)	38	28	50	51	9	8	10	12	8	14
Percent disagreement as to classification	[3] 6.8	. . .	. . .	. . .	[4] 6.0	. . .	. . .	— — —	. . .	. . .
ADULT REPORTERS										
Original interview rate	144	74	41	28	257	41	216	106	16	90
Net reconciled reinterview-original interview differences (percent)	24	16	44	19	7	1	8	5	6	5
Overreports—reported on original interview but not on reconciled reinterview (percent)	2	2	1	3	3	1	4	6	1	7
Underreports—not on original interview but reported on reconciled reinterview (percent)	26	20	35	29	5	6	5	9	12	9
Percent disagreement as to classification	[3] 6.8	. . .	. . .	. . .	[4] 5.9	. . .	. . .	— — —	. . .	. . .
CHILDREN										
Original interview rate	42	25	12	5	144	104	41	41	35	6
Net reconciled reinterview-original interview differences (percent)	45	29	61	88	8	8	10	10	6	41
Overreports—reported on original inview but not on reconciled reinterview (percent)	1	1	—	—	1	2	—	2	3	—

See footnotes at end of table.

examined those illnesses for which there was agreement between the original interview and the reconciled reinterview that the illness started in the 4-week recall period. For "all persons," 18 percent of such illness changed in classification between acute and chronic and/or presence or absence of activity restriction and/or medical attendance. Such shifts were relatively more frequent for children than for the adult respondent types. For matched chronic conditions the relative amount of disagreement among three severity level classifications was greatest for adult nonreporters, somewhat less for adult reporters, and least for children (table 57).

Factors Associated With Differences in Morbidity Between Reinterviews and Original Interviews

We shall now explore several hypotheses concerning factors which could aid in accounting for differences between the morbidity rates observed at original interview and at reinterview. Unless otherwise stated, the differences are based on the reconciled reinterview reports summarized in tables 56 and 57.

IMPROVED RECALL ON REINTERVIEW. In the section on length of recall period we pointed out that memory on the original interviews ap-

Table 57. Chronic conditions per 100 persons at original interview by level of severity, and days of restricted activity and days of bed disability per 100 persons per month, associated with illness reported at original interview, by type of illness, with net differences between reconciled reinterview and original interview rates, overreports and underreports as a percentage of original interview reports, and percentage of disagreement as to classification of restricted-activity days and chronic conditions, all by original respondent type: California Health Survey PES, July 1954–March 1955—Continued

(Persons found on reinterview to have been underreported or overreported are excluded. See table D-1)

Results of comparison of original interviews with reconciled reinterviews	Chronic conditions, by level of severity [1]				Restricted-activity days			Bed-disability days		
	All levels	Sub-stantial	Mod-erate	No reported effects	Total illness	Acute illness	Chronic illness	Total illness	Acute illness	Chronic illness
CHILDREN—Continued										
Underreports—not on original interview but reported on reconciled reinterview (percent)	45	28	64	88	5	6	4	8	5	29
Percent disagreement as to classification	[3] 2.3	. . .	. . .	. . .	[4] 5.5	. . .	. . .	– – –	. . .	. . .
ADULT NONREPORTERS										
Original interview rate	84	49	25	10	173	34	140	95	19	76
Net reconciled reinterview-original interview differences (percent)	70	42	95	140	28	9	33	11	−6	16
Overreports—reported on original interview but not on reconciled reinterview (percent)	7	5	8	12	1	4	—	—	—	—
Underreports—not on original interview but reported on reconciled reinterview (percent)	76	54	89	150	25	20	27	21	8	25
Percent disagreement as to classification	[3] 10	. . .	. . .	. . .	[4] 6.8	. . .	. . .	– – –	. . .	. . .
Measure of sample size for net differences and other percentages of original interview chronic conditions: [5]										
All persons	*75*	*41*	*22*	*13*						
Adult reporters	*43*	*22*	*12*	*8.4*						
Children	*8.8*	*5.3*	*2.5*	*1.1*						
Adult nonreporters	*24*	*14*	*7.0*	*2.9*						

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[1] See footnotes 1-3, table 8, for definitions of severity levels.

[2] In PES households, half the adult reporters and children were selected for reinterview. Figures are weighted inversely as the within-household sampling rate.

[3] Matched conditions with agreement that the condition is chronic, but disagreement regarding the three mutually exclusive classifications of level of severity.

[4] Persons with disagreement between the reconciled reinterview and the original interview classification of days of restricted activity in the nine classes: not ascertained whether there were days of restricted activity, number of days not ascertained, no days, 1-3, 4-7, 8-14, 15-21, 22-27, 28 days.

[5] For chronic condition rates and percentage disagreement regarding days, the measure of sample size is: all persons, 100; adult reporters, 38; children, 27; adult nonreporters, 36.

peared to be better for acute illnesses than for illnesses caused by chronic conditions, better for activity-restricting or medically attended acute illnesses than for the less severe acute illnesses, and better for the later weeks of the recall period (see discussion of table 12). This evidence on forgetting was obtained by examining the incidence of illness according to the number of weeks elapsing between the week of onset and the end of the recall period.

These findings, together with the differences among respondent types in the proportions of underreports found on reinterview, suggest that the increase in illness reporting on the reinterview might be the result of better memory for the earlier weeks of the recall period on the part of some respondent types.

Table 58 records for each respondent type the incidence of underreported illness for each week in the recall period as a ratio to the last week of the period. There is no substantial increase in recall of underreported incident illnesses by any respondent type for any particular week of recall.

REASONS FOR UNDERREPORTING CONDITIONS. For conditions named on the reconciled reinterview but not on the original interview, the reinterview respondent was asked the reason the condition has not been reported originally. A percentage distribution of the types of reasons given for such underreported conditions is given in table 59. It is of interest to note that original adult reporters and respondents for children attributed a substantial proportion of reasons for failure to report conditions at original interview to the original interview situation itself. Indeed, respondents for children claimed that 32 percent of the underreports had actually been mentioned to the original interviewer, who failed to record the report on the questionnaire. It is difficult to assess the validity of these statements, but they do suggest that original interviewers may have failed to record some conditions, despite instructions in the interviewing manual that all conditions mentioned by the respondent were to be entered regardless of the interviewer's judgment as to whether or not they constituted an illness.

Table 58. Incidence of underreported illness per 100 persons per week in the 4-week recall period, reported at reconciled reinterview, expressed as a ratio to the underreport rate for the last week in the recall period, by original respondent type: California Health Survey PES, July 1954–March 1955

(Excludes persons for whom original interviews were obtained one or more weeks later than the scheduled week. Persons found on reinterview to have been underreported or overreported also are excluded. See table D-1)

Original respondent type	Incidence of underreported illness in last week (week 1)	Number of weeks prior to end of recall period				*Measure of sample size* [1]
		1	2	3	4	
		Ratio to the last week (week 1)				
All persons [2]	2. 2	1. 0	1. 2	2. 1	0. 9	*1. 5*
Adult reporters	2. 6	1. 0	1. 5	. 4	. 8	*. 7*
Children	. 7	1. 0	2. 0	13. 5	2. 0	*. 1*
Adult nonreporters	3. 6	1. 0	. 5	1. 2	. 8	*. 9*

[1] For incidence rates, the measure of sample size is: all persons, 88; adult reporters, 33; children, 24; adult nonreporters, 31.

[2] In PES households, half the adult reporters and children were selected for reinterview. Figures are weighted inversely as the within-household sampling rates.

Table 59. Percentage distribution of those reconciled reinterview conditions that were underreports at the original interview, by reason for being omitted from the original interview, according to original respondent type: California Health Survey PES, July 1954–March 1955

(Persons found on reinterview to have been underreported or overreported are excluded. See table D-1)

Reason for omission from original interview	Original respondent type			
	All persons [1]	Adult reporter	Nonreporter	
			Child	Adult
Total underreports—not on original interview but reported on reconciled reinterview	100	100	100	100
Original respondent unaware of existence of condition	11	—	9	26
Other reasons attributable to original respondent	51	53	42	56
Condition too minor for original respondent to mention	20	14	16	30
Original respondent forgot to report condition	31	39	26	26
Reasons attributable to original interview situation	32	43	47	11
Original interview question not understood	5	6	7	4
Unfavorable circumstances at original interview	12	19	8	5
Recording error by original interviewer	15	18	32	2
Other reasons	2	1	1	4
Not ascertained	3	3	1	3
Measure of sample size	*35*	*13*	*6. 2*	*22*

[1] In PES households, half the adult reporters and children were selected for reinterview. Figures are weighted inversely as the within-household sampling rates.

Relationship of Original Interview Proxy Respondent to Nonreporter. Table 60 shows the relationship to children and adult nonreporters of the person who responded for them on the original interview. Mothers responded for more than 80 percent of the children, and fathers responded for a substantial proportion of the remainder. Spouses were proxy respondents for more than three-quarters of the adult nonreporters, usually the wife responding for a husband who was not at home at the time of interview. Mothers or mothers-in-law were proxy respondents for 11 percent of the adult nonreporters.

It was assumed that for children the parent or other person responsible for their care would usually furnish more accurate information than the child himself could furnish. For adult nonreporters, it seemed reasonable to assume that a husband or wife would furnish more adequate information than would a proxy respondent less closely related to the adult for whom he reported. If this was true, we would expect a greater degree of correspondence between original and reinterview conditions when the original interview proxy respondent answered for a spouse than when the proxy respondent reported for a nonspouse adult household member.

Table 60. Percentage distribution of children and adult nonreporters by proxy respondent's relationship to the nonreporter at original interview: California Health Survey PES, July 1954–April 1955

(Persons found on reinterview to have been underreported or overreported are excluded. See table D-1)

Relationship to nonreporter	Percent
PROXY RESPONDENT FOR CHILDREN	
Total	100
Parent [1]	94
Mother	81
Father	13
Person other than parent	6
Other female relative [2]	4
Other male relative [2]	0
Nonrelative	1
Self	1
Not ascertained	1
PROXY RESPONDENT FOR ADULT NONREPORTERS	
Total	100
Spouse	78
Wife	66
Husband	12
Person other than spouse	22
Mother	11
Father	1
Daughter [3]	5
Son [3]	0
Other female relative [2]	3
Other male relative [2]	1
Nonrelative	1
Not ascertained	—
Measure of sample size:	
Children	*27*
Adult nonreporters	*36*

[1] Includes stepparents. [2] Includes in-laws. [3] Includes stepchildren.

In tables 61 and 62 morbidity data from the independent subsample for nonreporters whose proxy respondent was a spouse are contrasted with data for those whose proxy respondent was a nonspouse. For each type of proxy respondent the tables compare the results found at independent reinterview and at the ensuing reconciled reinterview with the results from the original interview.

At original interview incidence of illness rates reported by proxy respondents for nonspouses were less than half those reported for respondents' husbands or wives (table 61). At independent reinterview, the incidence rate reported by those adults whose original proxy respondent was a nonspouse was some 210 percent higher than that reported at original interview. The corresponding increase for those adults for whom a spouse was the original proxy respondent was only 3 percent. Thus, the major net difference between the volume of incident illnesses reported independently at reinterview and at original interview is found for original adult nonreporters for whom a person other than a spouse was proxy respondent.

The differential for chronic conditions is not quite so marked. Although there was a net increase of 148 percent for adult nonreporters with nonspouse proxy respondents, even for adults for whom a spouse responded there is a net increase of 53 percent in the volume of chronic conditions at independent reinterview over the volume at original interview (table 62).

For incidence of illness (table 61), for which the net differences between original interview and independent reinterview are close to zero for adults whose spouse was the proxy respondent, the gross errors are still substantial. Thirty-two percent of the originally reported illnesses were independent overreports, while 40 percent were underreports.

In tables 61 and 62, following the percentages of overreports at independent reinterview, the percentages of overreports after reconciliation are summarized for the two proxy respondent types. The proportion of overreports matched by the reconciliation process may be found by subtracting the overreports at reconciled reinterview from the overreports at inde-

Table 61. Incidence of illness per 100 adult nonreporters per month at original interview, compared with independent reinterviews and ensuing reconciled reinterviews, with net differences between rates, matched, overreported, and underreported illnesses as a percentage of original interview illnesses, by illness type and severity, and by proxy respondent's relationship to the original adult nonreporter: California Health Survey PES, July 1954–March 1955

(Data are derived from independent reinterview subsample. Persons found on reinterview to have been underreported or overreported are excluded. See table D-1)

Results of comparison of original interviews with independent reinterviews [1] and ensuing reconciled reinterviews	Incidence of illness								
	Total illness			Acute illness			Chronic illness		
	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.
SPOUSE AS PROXY RESPONDENT									
Original interview rate	48	16	32	26	9	18	21	7	14
Net difference between rates (percent):									
Independent reinterview-original interview	3	5	2	3	−17	12	3	30	−11
Reconciled reinterview-original interview	20	18	21	17	8	21	24	30	21
Total reported at original interview (percent)	100	100	100	100	100	100	100	100	100
Matched with—									
Independent reinterview	68	82	60	61	75	54	76	90	68
Reconciled reinterview	83	96	77	72	92	62	97	100	95
Overreports—reported on original interview but not on—									
Independent reinterview	32	18	40	39	25	46	24	10	32
Reconciled reinterview	17	4	23	28	8	38	3	—	5
Underreports (percent)—not on original interview but reported on—									
Independent reinterview	40	9	56	47	8	67	31	10	42
Reconciled reinterview	40	9	56	47	8	67	31	10	42
NONSPOUSE AS PROXY RESPONDENT									
Original interview rate	19	6	13	15	6	10	4	—	4
Net difference between rates (percent):									
Independent reinterview-original interview	210	467	100	75	100	60	750	inf.	200
Reconciled reinterview-original interview	220	467	114	88	100	80	750	inf.	200
Total reported at original interview (percent)	100	100	100	100	100	100	100	100	100
Matched with—									
Independent reinterview	70	100	57	62	100	40	100	100	100
Reconciled reinterview	80	100	71	75	100	60	100	100	100
Overreports—reported on original interview but not on—									
Independent reinterview	30	—	43	38	—	60	—	—	—
Reconciled reinterview	20	—	29	25	—	40	—	—	—
Underreports (percent)—not on original interview but reported on:									
Independent reinterview	240	467	143	112	100	120	750	inf.	200
Reconciled reinterview	240	467	143	112	100	120	750	inf.	200
Measure of sample size for net differences and other percentages of original interview reports: [2]									
Spouse as proxy respondent	*4.4*	*1.5*	*2.9*	*2.5*	*0.8*	*1.6*	*2.0*	*0.7*	*1.3*
Nonspouse as proxy respondent	*.7*	*.2*	*.5*	*.5*	*.2*	*.3*	*.1*	—	*.1*

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[1] Data are based only on conditions reported at independent reinterview, but the classification by type of condition, starting date, and type and severity of illness is from the reconciled reinterview.

[2] For incidence rates, the measure of sample size is: spouse as proxy respondent, 12; nonspouse as proxy respondent, 4.5.

pendent reinterview. For both chronic conditions and incident illnesses, the proportion of matched overreports was greater for adults for whom spouses originally responded than for adults for whom other household members responded. This greater effectiveness of the reconciliation procedure for original nonreporters for whom a spouse was proxy respondent is consistent with our original hypothesis that the amount of agreement in morbidity reporting would vary with the kind of familial relationship between the original nonreporter and his proxy respondent. Even for the reconciled responses of the independent subsample, the percentage difference in morbidity rates between the reinterview and original interview is much less for original nonreporters whose wife or husband responded than for original nonreporters whose proxy respondent was some other related household member.

Table 62. Chronic conditions per 100 adult nonreporters at original interview, compared with independent reinterviews and ensuing reconciled reinterviews, with net differences between rates, matched, overreported, and underreported chronic conditions as a percentage of original interview chronic conditions, by level of severity, and by proxy respondent's relationship to the original adult nonreporter: California Health Survey PES, July 1954–March 1955

(Data are derived from independent reinterview subsample. Persons found on reinterview to have been underreported or overreported are excluded. See table D–1)

Results of comparison of original interviews with independent reinterviews [1] and ensuing reconciled reinterviews	Total chronic conditions	Level of severity [2]		
		Substantial	Moderate	No reported effects
SPOUSE AS PROXY RESPONDENT				
Original interview rate	80	43	26	11
Net difference between rates (percent):				
Independent reinterview-original interview	53	26	78	100
Reconciled reinterview-original interview	65	40	92	100
Total reported at original interview (percent)	100	100	100	100
Matched with—				
Independent reinterview	83	86	69	100
Reconciled reinterview	95	98	89	100
Overreports—reported on original interview but not on—				
Independent reinterview	17	14	31	—
Reconciled reinterview	5	2	11	—
Underreports (percent)—not on original interview but reported on—				
Independent reinterview	68	40	97	107
Reconciled reinterview	68	40	97	107
NONSPOUSE AS PROXY RESPONDENT				
Original interview rate	56	35	15	6
Net difference between rates (percent):				
Independent reinterview-original interview	148	144	150	167
Reconciled reinterview-original interview	159	161	150	167
Total reported at original interview (percent)	100	100	100	100
Matched with—				
Independent reinterview	83	83	88	67
Reconciled reinterview	93	100	88	67
Overreports—reported on original interview but not on—				
Independent reinterview	17	17	12	33
Reconciled reinterview	7	—	12	33
Underreports (percent)—not on original interview but reported on—				
Independent reinterview	166	161	162	200
Reconciled reinterview	166	161	162	200
Measure of sample size for net differences and other percentages of original interview reports: [3]				
Spouse as proxy respondent	*7.4*	*3.9*	*2.4*	*1.0*
Nonspouse as proxy respondent	*2.0*	*1.2*	*.5*	*.2*

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[1] Data on chronic conditions at independent reinterview are based only on conditions reported at independent reinterview, but the classification by type of condition and level of severity is from the reconciled reinterview.

[2] See footnotes 1-3, table 8, for definitions of severity levels.

[3] For chronic condition rates, the measure of sample size is: spouse as proxy respondent, 12; nonspouse as proxy respondent, 4.5.

Table 63 presents the change in reports of illness incidence between original interview and reconciled reinterview for the dependent and independent subsamples combined. The pattern is similar to that described for the independent subsample alone. Even though adults for whom a nonspouse was the original proxy respondent constitute only 22 percent of all adult nonreporters, they account for a disproportionate share of the differences between reinterviews and original interviews for adult nonreporters. For nonreporters whose spouse was proxy respondent originally, the percentage differences in the rates for incidence of illness on reconciled reinterviews (table 63) are similar to the corresponding figures for adult reporters (table 56).

This is not the case for chronic conditions. Differences between rates obtained in the two interview situations were greater for nonreporters whose spouse was respondent originally (table 64) than for adult reporters (table 57). This greater differential is far less, however, than that found for nonreporters whose proxy respondent was a nonspouse (table 64).

Since nonspouse proxy respondents appeared to be a particular source of bias in morbidity reporting, selected demographic characteristics

Table 63. Incidence of illness per 100 adult nonreporters per month at original interview, with net differences between reconciled reinterview and original interview rates, overreported and underreported illnesses, as a percentage of original interview illnesses, by illness type and severity, and percentage of matched conditions with disagreement as to classification, by proxy respondent's relationship to the original adult nonreporter: California Health Survey PES, July 1954–March 1955

(Persons found on reinterview to have been underreported or overreported are excluded. See table D-1)

Results of comparison of original interviews with reconciled reinterviews	Incidence of illness								
	Total illness			Acute illness			Chronic illness		
	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.
SPOUSE AS PROXY RESPONDENT									
Original interview rate	43	14	30	25	9	16	10	5	14
Net reconciled reinterview-original interview differences (percent)	26	34	23	18	14	19	38	69	27
Overreports—reported on original interview but not on reconciled reinterview (percent)	8	2	10	12	4	17	2	—	2
Underreports—not on original interview but reported on reconciled reinterview (percent)	33	18	40	31	11	42	35	31	36
Percent of matched conditions with disagreement as to classification [1]	14	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
NONSPOUSE AS PROXY RESPONDENT									
Original interview rate	27	9	18	20	7	13	8	2	5
Net reconciled reinterview-original interview differences (percent)	132	225	88	67	100	50	300	600	180
Overreports—reported on original interview but not on reconciled reinterview (percent)	12	—	18	11	—	17	14	—	20
Underreports—not on original interview but reported on reconciled reinterview (percent)	148	238	106	78	100	67	329	650	200
Percent of matched conditions with disagreement as to classification [1]	10	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Measure of sample size for net differences and other percentages of original interview reports: [2]									
Spouse as proxy respondent	*9.5*	*3.0*	*6.5*	*5.4*	*1.9*	*3.5*	*4.1*	*1.1*	*3.0*
Nonspouse as proxy respondent	*1.7*	*.5*	*1.2*	*1.2*	*.4*	*.8*	*.5*	*.1*	*.3*

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[1] Matched conditions with agreement as to starting in the 4-week recall period but disagreement regarding eight mutually exclusive classifications involving: (*a*) acute or chronic illness, (*b*) presence or absence of activity restriction, (*c*) presence or absence of medical attendance.

[2] For incidence rates, the measure of sample size is: spouse as proxy respondent, 28; nonspouse as proxy respondent, 7.9.

of the adults for whom they responded were examined. In table 65 the proportion of adults who were nonreporters in various age-sex groups is listed, and the age-sex groups are categorized according to two population characteristics often used in morbidity surveys: family income and number of adults in the household. In addition, the table contains information on the proportion of adults who had proxy respondents who were related adult nonspouse household members.

The proportion of adult males who were nonreporters declines steadily with age. Of males 18–34 years old, 61 percent were nonreporters, while for males aged 65 years and over the proportion of nonreporters was only 33 percent. Among adult females the proportion of nonreporters was about the same (15 percent) for all age groupings. For both males and females, the proportion who had a nonspouse as proxy respondent was highest for young adults aged 18–34 years and for persons aged 65 years and over, with the proportion being relatively low among middle-aged adults. It seems reasonable to conjecture that parents of young adults made up the major share of nonspouse proxy respondents for the age group 18–34, and that children of widowed or divorced older persons made up a substantial share of nonspouse respondents for persons aged 65 and over. Most nonreporters were males.

On the question of variations in the proportions of nonreporters within various family income groups, table 65 reveals that for all adults the proportion of adult nonreporters with a family income of less than $2,000 is 18 percent, rising to 33 percent for adults whose family income is between $2,000 and $5,000, and increasing still further to 40 percent for adults with family incomes exceeding $5,000.

Table 64. Chronic conditions per 100 adult nonreporters at original interview, with net differences between reconciled reinterview and original interview rates, overreported and underreported chronic conditions as a percentage of original interview chronic conditions, by level of severity, and percentage of matched chronic conditions with disagreement as to classification, by proxy respondent's relationship to the original adult nonreporter: California Health Survey PES, July 1954–March 1955

(Persons found on reinterview to have been underreported or overreported are excluded. See table D-1)

Results of comparison of original interviews with reconciled reinterviews	Total chronic conditions	Level of severity [1]		
		Substantial	Moderate	No reported effects
SPOUSE AS PROXY RESPONDENT				
Original interview rate	90	51	29	11
Net reconciled reinterview-original interview differences (percent)	57	30	75	137
Overreports—reported on original interview but not on reconciled reinterview (percent)	6	6	7	6
Underreports—not on original interview but reported on reconciled reinterview (percent)	63	43	67	143
Percent of matched chronic conditions with disagreement as to classification [2]	12	. . .	. . .	. . .
NONSPOUSE AS PROXY RESPONDENT				
Original interview rate	63	43	12	8
Net reconciled reinterview-original interview differences (percent)	129	90	264	143
Overreports—reported on original interview but not on reconciled reinterview (percent)	9	—	18	43
Underreports—not on original interview but reported on reconciled reinterview (percent)	138	95	273	171
Percent of matched chronic conditions with disagreement as to classification [2]	3. 8	. . .	. . .	. . .
Measure of sample size for net differences and other percentages of original interview chronic conditions: [3]				
Spouse as proxy respondent	*20*	*11*	*6. 3*	*2. 4*
Nonspouse as proxy respondent	*3. 9*	*2. 7*	*. 7*	*. 5*

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[1] See footnotes 1–3, table 8, for definitions of severity levels.

[2] Matched conditions with agreement that the condition is chronic but disagreement regarding the three mutually exclusive classifications of level of severity.

[3] For chronic condition rates, the measure of sample size is: spouse as proxy respondent, 28; nonspouse as proxy respondent, 7.9.

This rise in the proportion of nonreporters with increasing family income holds for all age-sex classes. In general the proportion of persons whose proxy respondent was not a spouse shows a similar relationship with family income.

Both the proportion of adults with proxy respondents and the proportion of adults with nonspouse proxy respondents rise markedly as the number of adults in the household increases.

Summary

As the reinterview was conducted by supervisory personnel, its quality should have been superior to that of the original interview. The

Table 65. Percentage of adults who were nonreporters and percentage who had a person other than spouse as proxy respondent, by sex and age, according to family income and according to number of adults in household: California Health Survey, May 1954–April 1955

Sex, age, and respondent type	Total	Family income			Number of adults in household[1]		
		Less than $2,000	$2,000–$4,999	$5,000 and over	2	3	4 or more
BOTH SEXES							
All ages, 18 and over:							
All adult nonreporters	34	18	33	40	35	45	52
Nonspouse as proxy respondent	8	5	7	10	2	25	36
18–34:							
All adult nonreporters	36	25	34	40	34	55	56
Nonspouse as proxy respondent	13	10	9	17	2	47	48
35–44:							
All adult nonreporters	37	19	35	39	39	40	48
Nonspouse as proxy respondent	4	4	3	4	2	12	30
45–64:							
All adult nonreporters	33	17	31	39	35	40	50
Nonspouse as proxy respondent	5	4	4	6	2	10	22
65 and over:							
All adult nonreporters	25	15	28	37	27	39	49
Nonspouse as proxy respondent	10	3	11	23	4	28	37
MALE							
All ages, 18 and over:							
All adult nonreporters	55	18	33	40	35	45	52
Nonspouse as proxy respondent	7	5	7	10	2	25	36
18–34:							
All adult nonreporters	61	25	34	40	34	55	56
Nonspouse as proxy respondent	17	10	9	17	2	47	48
35–44:							
All adult nonreporters	62	19	35	39	39	40	48
Nonspouse as proxy respondent	4	4	3	4	2	12	30
45–64:							
All adult nonreporters	53	17	31	39	35	40	50
Nonspouse as proxy respondent	4	4	4	6	2	10	22
65 and over:							
All adult nonreporters	33	15	28	37	27	39	49
Nonspouse as proxy respondent	7	3	11	23	4	28	37
FEMALE							
All ages, 18 and over:							
All adult nonreporters	15	9	14	18	12	29	37
Nonspouse as proxy respondent	9	5	7	9	2	23	32
18–34:							
All adult nonreporters	16	10	14	19	10	44	41
Nonspouse as proxy respondent	10	7	7	12	2	41	38
35–44:							
All adult nonreporters	13	7	10	15	11	19	31
Nonspouse as proxy respondent	4	4	3	5	1	10	29
45–64:							
All adult nonreporters	14	9	13	18	14	19	33
Nonspouse as proxy respondent	6	3	5	7	3	12	23
65 and over:							
All adult nonreporters	17	8	22	31	15	36	46
Nonspouse as proxy respondent	12	4	15	27	5	33	41

[1] Excludes persons in nondwelling unit quarters.

most striking finding about the reinterview itself was that its quality, as measured by the number of additional conditions reported, for example, varied markedly among reinterviewers.

In contrasting morbidity rates at independent reinterview with those at original interview, the net differences between the rates were close to zero for reinterviewed adult reporters, slightly positive for children, and substantial for adult nonreporters. The relative amount of gross error exhibited a corresponding variation with respondent type, but even for adult reporters it was considerable.

The reconciled reinterview, when the reinterviewer queried the respondent about discrepancies between the original interview and the independent reinterview information, furnished additional information about factors influencing the reporting of morbidity. In no instance was a condition dropped which had been reported on the independent reinterview but not on the original interview. On the other hand, conditions reported on original interview but not on independent reinterview were frequently acknowledged by the respondent to match at reconciled reinterview. Thus, the net effect of an independent reinterview followed by a reconciliation with the original interview was to increase the number of conditions reported. The impression gained from these analyses is one of considerable response variability, even for adult reporters. In general, this variability was greatest for the least severe types of conditions.

In assessing factors which might account for the relatively greater rate of illness given by nonreporters when reinterviewed directly, when compared with the reports furnished for them by their proxy respondents, it seemed plausible to look for the greatest recall of underreported illness in the earliest weeks of the recall period. The data did not support this hypothesis.

The closeness of the relationship of the proxy respondent to the nonreporter was a major factor in determining original interview-reinterview morbidity differentials. For 78 percent of the adult nonreporters, a spouse acted as proxy respondent. For these nonreporters the net differences in illness between original interview and reinterview were only slightly higher than the corresponding differences for reporters. (The differential in chronic condition rates was still substantial.) For the 22 percent of the nonreporters for whom a relative other than spouse acted as proxy respondent, differences between morbidity reported at original interview and at reinterview were striking. This relatively small group was primarily responsible for the large net differences observed for all nonreporters.

The data presented indicate a high amount of response variability, even for reinterviewed reporters. It also appears that the reinterview serves as a probing device, leading to the reporting of additional conditions. These and other considerations make it risky to infer from reinterview results presented here the biases which may result when all adults are not interviewed for themselves. The appropriate method is to conduct an experiment in which different rules for respondent selection are applied in each of two or more groups. This was the procedure used in the North Dakota Health Survey (*12*) and in the 1957 pretest for the National Health Survey (*13*).

The rule for respondent selection in the California Health Survey was that each adult who was at home when the original interviewer called was interviewed for himself. Data from the PES suggest that it may be appropriate for a person to act as proxy respondent for an absent spouse, but that other relatives who are absent at the time of the first interview should be interviewed directly. Further research may result in a more complex set of rules about interviewing adults for themselves as against accepting proxy respondents. A potential proxy respondent might be asked the extent of his knowledge about the absent member's health status. Rules for determining whether or not a proxy respondent can be used might involve both his relationship to the absent person and his attitudes about making an adequate response for the absent person. Similar considerations apply to the use of proxy respondents for older children, some of whom may be able to provide better information for themselves than their parents could provide.

It is likely that postenumerative surveys will play an increasingly important role in improving techniques for data collection in morbidity surveys. The wide variations in the quality of the reinterviewing in the California Health Survey PES suggest that considerable attention needs to be devoted to all aspects of reinterviewer training, including systematic checks on the quality of the reinterviewing. Exact criteria need to be set forth for determining whether or not conditions named on original interview and reinterview are the "same," and criteria for determining the adequacy of explanations for differences between original interview and reinterview responses need to be set forth. As a further aid in assessing the results of postenumerative surveys, it would be important to determine whether the sex of the reinterviewer and other reinterviewer characteristics are significantly associated with the quality of the reinterview data.

7. Interviewer Characteristics as Related to Their Survey Performance

San Jose Survey

A staff of 20 part-time interviewers paid by the hour was used for the San Jose Survey. All of them were locally recruited women interested in part-time employment. (Only women were hired as interviewers, since housewives would usually be the reporters and since qualified women were more likely to be available for part-time work than were qualified men.) Most of the interviewers were in the age range 30–45 years. A few of them had previous experience as interviewers in the 1950 census and in special censuses.

Field supervisors conducted classroom training of interviewers for 3 days. This training covered the interviewers' manual and included practice exercises in the use of the manual and in the conduct of interviews. Primary emphasis was placed on having each interviewer follow a prescribed sequence of questioning and ask all questions exactly as worded on the questionnaire. The objective was to establish an explicit procedure as a basis for control of interviewer effects, so that the validity of the data might be a function primarily of the questionnaire and survey procedures. However, the open-ended nature of the questions used for eliciting reports of conditions and information about such conditions placed definite limitations on how far this objective could be realized.

Following their training, interviewers started the interviewing of sample households. These early interviews constituted an extension of the formal training operations, since each interviewer was accompanied by an experienced observer. The function of the observer was to discover and correct any patterns of error or misunderstanding on the part of the interviewers which indicated that they did not understand or know how to use the instructions and procedures for the survey. The supervisors edited and reviewed all questionnaires. Those found to be incomplete or to have inadequate or inconsistent entries were returned to the interviewer for followup visits to obtain additional information. To permit evaluation of differences among interviewers, all assignments to interviewers were randomized on a segment basis. This resulted in assignments of 20 segments for each of the 20 interviewers.[9] The original plan called for each interviewer to perform all interviewing in the segments assigned to her. The heavy workload on the interviewing staff and interviewer resignations sometimes made it impossible to carry out the planned pattern. Figure 14 shows for each experimental group the pattern by which interviewers completed work in the assignments. Departures from the planned pattern are represented by cells containing more than one interviewer number.

In the San Jose Survey each interviewer took a special battery of general aptitude tests and a test on attitudes which included questions on the interviewer's attitude toward illness. Since the assignments to interviewers were random, it is possible to see if the test results are related to the illness rates obtained subsequently by the interviewers. The special battery of aptitude tests given the interviewers included tests of spatial relationships, arithmetic, and vocabulary. A scoring system was devised to summarize the results of these three tests. A passing score of 109 or better had been established by the agency which developed the tests. Although almost half the interviewers failed the test, the scores were not considered in deciding whether to give an interviewer an initial assignment or, during the course of the survey, whether to continue an interviewer. This policy permitted examination of the performance of interviewers with scores below passing.

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[9] Calculations of interviewer variances based on this randomized design will be reported in a later publication.

The question on attitude toward illness was: "Would you consider a person (14 years of age or older) sick or not today, if he or she had one of the following symptoms? (1) Sore Throat, (2) Congestion on Chest, (3) Dizziness, (4) Fever, (5) Tooth Extraction, (6) Hacking Cough, (7) Upset Stomach, (8) Running Nose, (9) Blood in Sputum, (10) Rapid Pulse, (11) Splitting Headache, (12) Painful Joints." The question was repeated for "a child (under 14 years of age)" followed by a list of the same 12 symptoms. The response patterns to this question appeared not to be scalable. For each interviewer an arbitrary score was obtained

Figure 14. Code numbers of interviewers working within assignments and number of segments completed by each interviewer,[1] by initial and repeat interview group number: San Jose, February–June 1952

Stratum and assignment number	Initial interview groups						Group II, repeat interviews		
	I (Feb.)	II (Mar.)	III (Mar.)	IV (Apr.)	V (May)	VI (June)	First (Apr.)	Second (May)	Third (June)
Stratum A:									
No. 1	3(9) R 17(4) 18(1) 28(6)	20	17(9) 18(4) 15(7)	17(7) 18(11) 20(2)	26	26	20(7) 18(7) 26(6)	26	26
2	6	6	6	6	6	6(18) R 21(2)	6	6	16(17) R 21(3)
3	17	17	17	17	17	17	17	17	17
Stratum B:									
No. 4	18	18	18	18	18	18	18	18	18
5	28	28	28	28	28	28	28	28	28
Stratum C:									
No. 6	1	1	1	21(1) 1(19)	21	21	21(part) 1(part)	21	21
7	2	2	2	2	2	18	2	2	18
8	4	4	4	4	4	23	4	4(19) R 23(1)	23
9	7	7	7	1(5) 7(15)	7	7	21(6) 7(14)	7	7
10	9	9	9	9	9	9	9	9	9
11	12	12	12	5	5	5	5	5	5
12	13	8	8	8	19(11) R 21(9)	21	18	21	21
13	15	15	15	15	15	15	15	15	15
14	16	16	16	16	16	21(10) 29(10)	16	16	29(12) 16(8)
15	24	24	24	24	22(17) R 21(3)	15	24	22(2) R 21(18)	15
16	25(13) R 14(5) 26(2)	11	11	11	11	11	11	11	11
17	26	26	26	26	20	17	26	20	17
18	10	10	10	10	10	10	10	10	10
19	27	27	18(2) 27(18)	27	1(14) R 18(6)	18	27	18	18
20	29	29	29	29	29	29	29	29	29

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[1] The number in parentheses following the interviewer's code number is the number of segments completed. If no parenthetic figure is shown, the given interviewer completed the entire 20 segments in the assignment. The letter "R" denotes that the given interviewer resigned.

Table 66. Ranking of interviewers according to incidence of illness rates obtained by interviewers, aptitude test scores, and illness attitudes of interviewers: San Jose, January [1] 1952

(Excludes two assignment groups in which the work was done by more than one interviewer)

Interviewer's rank [2]			Incidence of illness per 100 persons per month	Interviewer's aptitude test scores	Number of symptoms designated as illness by interviewer
Incidence rates	Aptitude test	Illness attitude			
1	11	8.0	56	104	22
2	5	8.0	54	119	22
3	6.5	15.0	41	113	19
4	14	2.5	40	96	24
5	10	10	36	109	21
6	9	12.0	32	110	20
7.5	2	15.0	29	141	19
7.5	1	2.5	29	142	24
9	3	5.5	21	134	23
10	4	2.5	20	125	24
11.5	13	5.5	18	102	23
11.5	6.5	17	18	113	15
13	18	2.5	15	88	24
14.5	17	8.0	13	89	22
14.5	15.5	18	13	95	14
16	12	15.0	12	103	19
17	15.5	12.0	11	95	20
18	8	12.0	8	111	20

[1] Group I, initial interviews. [2] Ties are shown by .0 or .5 following the rank number.

by summing the number of symptoms considered as sickness for adults and children combined. These scores ranged from 14 to the upper limit of 24.

Table 66 shows the interviewers' ranks according to the illness incidence rates obtained for the first month of interviewing, their aptitude test score, and the number of symptoms they designated as illness. To test the hypothesis that the illness rates obtained by beginning interviewers are independent of the interviewer's aptitude scores and her attitudes toward illness, rank correlations were computed, using Kendall's *tau*. In comparing the ranks for incidence rates and aptitude scores, *tau* is 0.25; *tau* is 0.17 for comparisons of incidence rates and number of symptoms regarded as illness. Using a one-sided test at the 10 percent significance level, the hypothesis of independence of rankings is rejected for incidence rates versus aptitude scores,[10] but is not rejected for incidence rates versus illness attitudes. Similar ranks were computed for the incidence rates obtained from the initial interviews of group V. For these more seasoned interviewers, *tau* was 0.14 for incidence rates versus aptitude scores, and 0.15 for incidence rates versus the interviewer's illness attitudes. Neither of these values is significant at the 10 percent level.

California Health Survey

A staff of about 25 part-time interviewers was recruited locally for the California Health Survey. All were women, paid by the hour. Some of the interviewers had previous experience in surveys and censuses conducted by the Bureau of the Census in California.

Two Census Bureau field offices were established, one in San Francisco, the other in Los Angeles. Supervisors assigned to these field offices were trained in survey procedures. Using a prescribed set of training instructions, these supervisors then trained the interviewers. Formal training lasted for 3 days, after which the interviewers were observed in practice interviews by a member of the supervisory staff. Questionnaires were edited in the field offices, and a tally was kept of omissions, inconsistencies, and inadequate entries. The more serious errors were corrected by telephoning the household or by a personal visit. The tally of errors found in editing was kept for each interviewer for each sample-week assignment. This was one of the procedures used to aid in controlling interviewing quality.

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[10] There is some indication in table 66 that the relationship between incidence rates and aptitude test scores may not be monotonic. In general, those interviewers with higher aptitude test scores have medium incidence rates, those with medium aptitude scores have high incidence rates, and those with low aptitude scores have low incidence rates.

Current information about errors found in the Post Enumeration Survey was also used to control the quality of the interviewing. Results of the Post Enumeration Survey were recorded weekly for each interviewer, cumulated in accordance with instructions, and compared with given quality standards. An interviewer was "rejected" (considered as not meeting standards) whenever the number of differences found between the original interviews and reinterviews reached a specified rejection number. The rejection number depended upon the number of persons or conditions examined. Follow-up action was mandatory for rejected interviewers. This took the form of review of the interviewer's work and special training, followed by observation of the interviewer during her conduct of several interviews, and by conduct of a supplementary Post Enumeration Survey for several households subsequently interviewed.

In the San Jose Survey, assignments were made to interviewers on a random basis, so that significant differences between interviewers in morbidity rates could be used to indicate variations in the quality of interviewing. In the

Table 67. Ranking of interviewers within administrative areas, according to California Health Survey chronic condition rates and percentage of conditions that were underreported in the Post Enumeration Survey: California Health Survey, May 1954–April 1955; Post Enumeration Survey, July 1954–March 1955

(Interviewers who obtained fewer than 10 [weighted] original interview conditions are excluded)

Interviewer's rank [1]		California Health Survey: Chronic conditions per 100 persons	Post Enumeration Survey: Underreports as percentage of original interview conditions [2]	*Measure of sample size*	
California Health Survey: Chronic condition rates	Post Enumeration Survey: Underreports as percentage of original interview conditions			*California Health Survey: Chronic condition rates*	*Post Enumeration Survey: Underreports as percentage of original interview conditions*
Administrative area I					
1	1.5	150	—	*0.3*	*0.8*
2	8	120	14	*4.0*	*4.6*
3	4	119	9	*6.5*	*12.2*
4	3	109	7	*.6*	*1.2*
5	5.5	108	10	*3.5*	*2.8*
6	1.5	103	—	*1.8*	*2.5*
7	12	94	28	*3.6*	*3.5*
8	8	92	14	*4.7*	*5.4*
9	14	90	38	*4.1*	*2.4*
10.5	8	89	14	*5.4*	*3.3*
10.5	10	89	25	*5.1*	*2.6*
12	5.5	77	10	*2.7*	*.8*
13	13	71	37	*5.0*	*3.3*
14	15	64	42	*3.1*	*2.1*
15	11	59	27	*4.5*	*3.5*
Administrative area II					
1	1	149	18	*0.7*	*0.7*
2	4	140	35	*3.3*	*6.0*
3	3	137	34	*2.1*	*1.4*
4	6	113	51	*7.0*	*16.8*
5	2	106	32	*2.5*	*1.9*
6	8	105	55	*4.0*	*5.6*
7	7	102	52	*6.8*	*7.1*
8	10	92	208	*2.4*	*1.6*
9	5	83	40	*5.3*	*3.7*
10	9	67	77	*2.7*	*2.3*

[1] Ties are shown by .5 following the rank number.

[2] In PES households half the adult reporters and children were selected for reinterview. Figures are weighted inversely as the within-household sampling rates.

California Health Survey, it was not economical to randomize interviewer assignments. Hence, differences in morbidity rates between interviewers could not in themselves contribute information concerning interviewer variability. However, as one of the objectives of the Post Enumeration Survey was to control the quality of interviewing, information was obtained on how apparent quality differences among interviewers were related to morbidity rates obtained at original interview. The Post Enumeration Survey (described in section 6) consisted of reinterviews of a subsample of California Health Survey households by supervisory personnel. There were wide differences among interviewers in the proportions of underreported morbidity conditions (conditions elicited by the supervisor at reinterview but not by the interviewer at original interview). For the various interviewers, the proportion of underreported conditions ranged from 0 to almost 200 percent of the number of originally reported conditions. Even though the interviewer assignments were not random, such variations among interviewers in the proportions of underreported conditions suggest differences in interviewer quality.

If we assume a uniform quality of reinterviewing, then variations among original interviewers in the proportions of underreported conditions would reflect differences in the quality of the original interviews. In the following analysis we shall control on administrative area as a rough means of controlling on the quality of the reinterviewing. Since some interviewers worked for only a portion of the survey year, chronic condition rates at original interview were chosen to reflect interviewer quality, because such rates should be little influenced by seasonal factors.

Table 67 shows, separately for administrative areas I and II, ranks of original interviewers according to decreasing rates of chronic conditions obtained on the original interview and ranks according to the proportion of underreported conditions found for each, with the lowest proportion of underreports assigned the lowest rank. In general, within each administrative area, the proportion of underreports declines as the relative volume of chronic conditions reported by the original interviewer increases.

These data suggest that there were substantial differences even in the quality of the original interviewing. For those interviewers who obtained a high rate of chronic conditions, the reinterviewers obtained a relatively low percentage of additional conditions. Thus, in a morbidity survey without random assignments to interviewers, relatively low chronic condition rates may aid in detecting interviewers in need of special attention.

Summary

The San Jose Survey experience, based on randomized interviewer assignments, revealed a slight positive relationship between the interviewer's survey performance (as measured by illness incidence rates) and the number of symptoms designated as sickness by the interviewer in a test prior to the start of the survey. There was also a slight positive relationship between survey performance and aptitude test scores.

In the California Health Survey interviewer assignments were not randomized. However, rather wide variations in the proportions of underreported conditions found in a Post Enumeration Survey suggested sizable differences among interviewers in their survey performance.

part II

Uses of Record Data

In the San Jose Survey an intensive effort was made to evaluate uses of morbidity data that were kept in records. Morbidity information was collected from hospital and physician records and from a number of agencies which kept morbidity information to satisfy the purposes of their own particular programs. (Each adult in the survey was asked to sign a form authorizing physicians, hospitals, and other agencies to furnish the California Department of Public Health with medical information concerning both diagnosed and undiagnosed conditions for which the person was seen. Parents of minor, unmarried children were asked to extend the authorization to them.)

In the early discussions preceding the San Jose Survey, some of the participants maintained that record data should be viewed as an alternative to sample survey information.[11] It was suggested that such data be used as an index of general morbidity for the population as a whole. The programs from which medical record data could be derived covered only certain segments of the population and, frequently, only certain illnesses. The coverage of many of these programs was also subject to change from one period to another because of administrative and other reasons. Development of adjustment factors to be applied to one or more sets of operating program data for the purpose of predicting morbidity in the general population requires that these factors be checked and possibly revised periodically. It was recognized at the outset that even though a set of relationships between estimates derived from population survey data and those from operating program data might be developed, it would not be possible to determine whether such relationships could be used to provide estimates of morbidity in the general population on a continuing basis. Experience gained in the San Jose Survey also indicated that the cost of using existing records is not low.

Dorn (*15*) has pronounced the following judgment on viewing medical records as an alternative to morbidity surveys:

> **"The records of hospitals, clinics, prepaid medical care plans and health insurance programmes usually are kept for administrative purposes and not to provide morbidity data *per se*. In the past there has been a tendency to look at these existing accumulations of records in the belief that they must contain a gold mine of information concerning morbidity. This has been followed by attempts to decide to what uses these data might be put. This is a poor man's approach to the study of morbidity.**
>
> **"If morbidity data are to be used efficiently for the purposes specified . . . , the usual procedure of the past should be reversed. The first step is to decide the purpose for which morbidity data are needed, the type of data required, and the most efficient and practicable method of obtaining these data. The extent to which existing records . . . may be utilized can then be determined. . . . Information compiled from existing records, even though the cost of collection is relatively low, is not a bargain if such information does not adequately serve the purpose for which it is needed."**

The major deficiencies of most record data as well as the development of new needs for morbidity information not available in any record source forced a rephrasing of the original issue. For most current uses of morbidity data the relevant question is: How can record data and morbidity survey information be used jointly to produce the most efficient results? These uses include validation of morbidity survey information, estimates for rare morbidity conditions, and greater detail for limited geographic areas. (It is recognized that medical records contain certain types of information not elsewhere available; technical data about the type of medical care received, for example.) The first part of the discussion which follows deals with validation of household survey data, and the remainder points out other uses of medical record data in conjunction with sample survey information.

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[11] This posing of sources as competing alternatives rather than complementary procedures has a more recent counterpart in discussions of morbidity survey reporting versus clinical examination procedures. See, for example, Feldman (*14*).

1. Validation of Survey Data

Before attempting to validate survey information by use of a criterion source several problems must be considered. These include (*a*) choice of the criterion source, (*b*) completeness of coverage of the criterion source, and (*c*) rules and methods for matching the survey data with the criterion source.

Choice of the criterion source. The designation of a source as a criterion against which to validate survey information is a discretionary step. The ultimate authority to which most persons refer for determining the presence or absence of disease and its diagnosis, if present, is the clinical evaluation. Two observations about the statistical aspects of diagnosis should be made. First, it is important to direct attention to the point in time which defines the earliest existence of the disease from the medical standpoint. There may be considerable variation among clinicians as to the point at which they are willing to assert the existence of a given disease. Second, when the clinician does make a diagnosis he is making a prediction that a certain course of events characteristic of this disease will follow, unless there is treatment. Little is known as yet about the accuracy of such predictions.

Completeness of coverage of the criterion source. The criterion source may not itself completely cover the conditions one wishes to validate. Conditions for which a person has not sought medical consultation cannot be validated from medical record sources. For conditions for which a physician was seen, one cannot always be sure that an appropriate entry exists in the physician's records. (Nor can one always be sure that the physician has told the patient about a condition entered in the medical record). It is also possible that the criterion source may contain erroneous inclusions.

Rules and methods for matching the survey data with the criterion source. Matching of morbidity survey data in the San Jose study with the criterion source generally proceeded in two stages: (*a*) determining whether the person was the same in the criterion source as in the survey, followed by (*b*) determining whether the condition in the criterion source was the same as that in the survey. Discrepancies in the spelling of the name, as well as variations in personal characteristics such as age, made it necessary to establish rules for determining persons who match. Likewise, since a respondent's description of the condition may not correspond to the definition in the medical record source, it was necessary to establish rules for determining when the conditions from the two sources were the same. Clearly, variations in these rules will affect the relative volume of matched conditions.

Reporting of Hospitalized Illness

For the 7 months prior to the beginning of the San Jose Survey and for the 5 months of the survey, the four general hospitals and the State mental hospital in the area prepared abstracts of the records of patients living in San Jose. For the initial matching operation, a search was made of all hospital records for all persons included in the survey who lived in the city of San Jose.[12] Hospital records for these persons were compared with the hospitalization information obtained in the household survey. There were hospital records of some illnesses

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[12] For the reports of hospitalized illness and for other studies using medical records (discussed in subsequent portions of this section), only survey reports of persons living in the city of San Jose were included. Data from a nearby rural area are included in statistics dealing with household sample survey methods but are excluded from statistics dealing with the uses of data from medical record sources.

which had not been reported in the survey (underreports), and there were some illnesses reported in the survey but not in the hospital records (overreports). The results of the matching procedure are shown in table 68. The 11 percent of hospital admissions which were overreported almost balance the 14 percent which were underreported.

Table 69 compares some common measures of hospitalization, as derived (*a*) from the survey reports and (*b*) from hospital records for the same persons covered by the survey reports. The rates, derived independently from the two sources and applying to the same people, are almost identical.

Diagnoses from the survey reports and from hospital records were coded according to the three-digit codes of the International Statistical Classification of Diseases, Injuries, and Causes of Death. The distributions of diagnoses from the two sources were quite similar. The 242 cases for which diagnoses were available both from the survey reports and from the hospital records are analyzed for diagnostic agreement in table 70. There was agreement between diagnoses at the 800-usable-diagnostic-categories level in 61 percent of the cases. At the 100-categories level, this agreement increased to 76 percent, and when the data were arranged into 15 diagnostic categories, the agreement was 85 percent. To provide a basis for evaluating the comparison of household survey reports of diagnoses with other sources, matched records of the same event from two medical sources were compared. Some results of this comparison are also shown in table 70, where death certificates for 429 persons who died in San Jose hospitals are compared with hospital abstracts containing the hospital's final diagnosis for the same persons. Seventy-seven percent of the diagnoses agreed at the 800-diagnostic-categories level, 91 percent at the 100-categories level, and 95 percent at the 15-categories level. Thus, the extent of diagnostic agreement between two matched medical sources, while better than that between the matched survey report and hospital record, is not perfect. This is an example of the extent of disagreement between two criterion sources.

Table 68. Percentage of survey-reported hospital admissions which were matched, overreported, and underreported when compared with hospital records: San Jose, July 1951–May [1] 1952

(Excludes persons living outside the San Jose city limits)

Results of comparison	Percent
All survey reports of hospital admission	100
Matched with hospital records	89
Overreports—reported in survey but not in hospital records	11
Underreports—not reported in survey but reported in hospital records	14
Number of survey reports of hospital admission	*279*

[1] Groups I–VI, initial interviews. Check period varied from 7 to 11 months for the different groups in the sample.

NOTE: Data adapted from table 2 of Belloc (*11*).

Table 69. Measures of hospitalization from survey reports and from hospital records: San Jose, July 1951–May [1] 1952

(Excludes persons living outside the San Jose city limits)

Measures	From survey reports	From hospital records
Admissions per 1,000 persons per year	66	68
Days of hospitalization per person per year	.61	.66
Average number of days stay per period of hospitalization	9.1	9.5
Percent of admissions with surgery	43	44

[1] Groups I–VI, initial interviews. Check period varied from 7 to 11 months for the different groups in the sample.

NOTE: Data adapted from table 3 of Belloc (*11*).

Table 70. Percentage of diagnostic agreement on comparing survey reports with hospital records and hospital records with death certificates, according to number of usable diagnostic categories: San Jose, July 1951–May [1] 1952

(Excludes persons living outside the San Jose city limits)

Type of comparison	Number of usable diagnostic categories			*Number of matched records*
	800	100	15	
Survey report with hospital record	61	76	85	*242*
Hospital record with death certificate [2]	77	91	95	*429*

[1] Groups I–VI, initial interviews. Check period varied from 7 to 11 months for the different groups in the sample.

[2] Cause of death compared with final diagnosis on hospital record.

NOTE: Data adapted from appendix C of Belloc (*8*).

For further details on the validity of reporting of hospitalized illness, the paper by Belloc (*11*) should be consulted. Her investigation indicated that survey reports of hospitalization were reasonably accurate for most practical purposes.

The San Jose hospital records had few disadvantages as a criterion source. However, when one attempts to validate the less severe illnesses reported in household surveys, the criterion sources become less satisfactory.

Reporting of Other Medically Attended Illness

Checks With Medical Records. In the San Jose Survey, records from a number of sources in addition to hospitals were accumulated. These included reports of medical attendance during the survey period for persons reported in the survey as members of a medical care plan. In addition, files of records covering all residents of San Jose included State disability insurance claims, physicians' first reports of work injuries, reports of Crippled Children's Service, death certificates, acute communicable disease reports, and reports of patients treated at the city's first aid station.

The scope of the types of illness covered by certain of these record sources, such as acute communicable disease reports, was so limited that the number of records appearing for persons in the sample was extremely small. Also, for certain record sources, limitations on the types of illness or the eligibility for care made it impossible to define in the survey itself the particular morbidity measure for which comparison was sought. For example, it was possible to check the persons in the survey against disability insurance claimants, to match the reports of illness in the survey against the insurance claim reports, and even to identify certain periods of illness which apparently were underreported in the survey. However, it was not possible to determine which persons in the survey were eligible to file claims for disability insurance. Therefore, it was not possible to identify survey reports for which no claim was filed.

For most of the sources of medically attended illness, checks could not be made on the degree of overreporting as compared with underreporting in the household survey. Consequently, it was not possible to measure the net differences between survey data and these independent sources of data. For record reports of medically attended illness which matched those from the survey, it was possible to measure extent of diagnostic agreement.

The extent of diagnostic agreement between survey reports and some of the criterion sources mentioned above are shown in table 71. In order to provide an additional basis for evaluating the comparison of household survey reports of diagnoses with records from other sources, comparisons of records of the same event were made between two matched medical record sources. When disability insurance claims involving hospitalization were compared with hospital records, 83 percent of the diagnoses agreed at the 800-usable-diagnostic-categories level, 91 percent at the 100-categories level, and 95 percent at the 15-categories level. These results are similar to those found when hospital records were compared with death certificates, providing a further illustration of inconsistencies between criterion sources.

The degree of agreement shown in the comparison of household survey reports with medical records depends on the type of medical records used as the criterion (table 71). Agreement is highest for records in which there is a restricted range of diagnoses, such as accidents.

Table 71. Percentage of diagnostic agreement on comparing two medical records and on comparing survey reports with various medical records, according to number of usable diagnostic categories: San Jose, July 1951–May [1] 1952

(Excludes persons living outside the San Jose city limits)

Type of comparison	Number of usable diagnostic categories			*Number of matched records*
	800	100	15	
Hospital records with disability insurance claims	83	91	95	*236*
Survey reports with—				
Emergency clinic cards	69	81	100	*26*
Acute communicable disease reports	91	94	97	*33*
Physicians' first reports of work injuries	50	73	96	*26*
Crippled Children's Service records	69	77	85	*13*
California Physicians' Service records	47	63	72	*32*
Disability insurance claims:				
Hospitalization in past year	44	66	85	*41*
Current illness	40	60	77	*47*

[1] Groups I–VI, initial interviews. Check period varied from 7 to 11 months for the different groups in the sample.

Note: Data adapted from appendix C of Belloc (*8*).

Reports involving hospitalization show a lesser degree of agreement. Reports containing the widest range of diagnoses, the disability insurance claims and the California Physicians' Service records, show the lowest degree of agreement, ranging from about 40 percent at the 800-diagnostic-categories level to 70 percent at the 15-categories level.

INQUIRIES OF PHYSICIANS. In the questionnaire for the San Jose Survey, the names and addresses of physicians seen for illnesses and chronic conditions were recorded. Also, if the person reported having "a doctor he usually goes to," the name and address of the doctor was entered. Authorizations for physicians and other agencies to furnish the California Department of Health with medical information were received for 87 percent of the persons in the survey.

In the National Health Survey of 1935–36 the accuracy of diagnostic information furnished by respondents was investigated by asking physicians to verify the statements made about medically attended illness furnished in the survey (*16*). Although the degree of correspondence in diagnoses appeared high, it was thought that physicians might have had a tendency to "verify" almost any statement by their patients in a situation in which they were being questioned by a government agency. It was thought that the National Health Survey evaluation of diagnostic information supplied by respondents would have been more convincing if an independent diagnosis had been requested of the physicians and then compared with the respondent's report. This consideration influenced the design of the inquiry of physicians in the San Jose Survey.

The form sent to physicians named in the San Jose Survey (appendix E) contained the name, age, and address of the person and asked the physician to record, on separate lines, each illness, injury, or chronic condition for which he saw the person during the period from January 1, 1952, to June 30, 1952. Space was designated for the diagnosis, and he was asked to enter the dates he first and last saw the patient for each condition. (If he did not see the patient during the 6-month period; he was asked to indicated the approximate date he last saw him and to give a description of the illness, injury, or chronic condition present at that time.) To insure the independence of his report, the physician was not informed of the report of illness given in the survey.

In order to cover a broad period of illness experience, inquiries to physicians were sent for two of the San Jose Survey experimental groups which provided information for several months: group II (which provided an initial interview and three repeat interviews) and group III (which provided an initial interview, an initial diary, and a first repeat diary). Inquiries were sent to physicians in Santa Clara County named by these two groups as follows:

Group II

1. As attending illness in the 1-day or calendar-month recall period on the initial interview or any of the three repeat interviews.
2. As having attended chronic conditions at any time.
3. In response to the question, "Does he have a doctor he usually goes to?"

Group III

1. As attending illness in the 1-day or calendar-month recall period on the initial interview or illness recorded on either of the two diaries.
2. As having attended chronic conditions at any time.

These physicians were sent a letter signed by a local physician who was a member of the San Jose Project Advisory Committee, explaining the purpose of the survey and the reason for the request for diagnostic information (appendix E). Each physician was sent a form for each person naming him as the attending physician. Inquiries were made for about 68 percent of the persons in group II and 36 percent of those in group III. About a month after the forms were sent out, telephone calls were made to physicians who had not sent in their forms. In all, 85 percent of the physicians responded to the inquiry and returned 81 percent of the forms.

When the forms returned by the physicians were analyzed, it became apparent that the effort to avoid biasing the physician made it difficult to validate the survey information. In some cases there was agreement as to the condition treated but disagreement as to the date. In other cases the physician and the survey specified the same date but differed as to the condition under treatment. Survey reports of medically attended infective diseases, colds, influenza, and other respiratory infections were relatively more numerous than reports in these categories from physicians. This seemed to result from a tendency on the part of physicians to report the chronic conditions for which they were treating the patient and to omit the acute illnesses. Pediatricians almost without exception reported the preventive care which they had given and omitted mention of the colds and other acute illnesses reported in the survey. Thus, the records kept by some physicians apparently did not contain information comparable to that obtained in the survey. This could be due either to the patient's failure to inform the physician of the morbidity condition subsequently reported in the survey, or to the physician's not entering complete information in his records about the patient's conditions, or to the physician's failure to tell the patient about a given condition.

In addition to the difficulties listed above, there were other problems with this criterion source as regards its completeness. To obtain a more complete measure of the number of illnesses which were reported as medically attended but which no physician reported having attended (overreports), and a more complete measure of illnesses for which the physician was seen but which the respondent failed to report (underreports), it would have been necessary to check the files of all physicians in the area. This was not done.

The San Jose Survey experience suggests that future attempts at validation of medically attended conditions reported in a sample survey should attempt to make the criterion source more complete. In the San Jose attempt with physician inquiries, it would seem that the physician was put in a relatively unstructured situation. A more promising approach might be to ask the physician to furnish an independent statement of the illnesses and conditions for which he treated the patient during a specified time period. This would be followed by revealing the survey respondent's statement to the doctor and asking him to account for any discrepancies. Ideally, this would be followed by a reconciliation of any remaining discrepancies with the patient. Such a process should reveal much about the factors which account for discrepancies, and should provide a better basis for assessing and improving the validity of survey reports of medically attended conditions.

2. Other Uses of Record Data

Even though a sample survey may not provide complete morbidity data, a sample survey is necessary in order to define a population at risk and to cover illnesses and population characteristics not available in any actual or potential record sources. The question is not whether to use record sources as "alternatives" to household survey data. Rather, it is how to use auxiliary sources efficiently in conjunction with sample survey information.

We have discussed in the previous paragraphs the uses of record sources in the validation of sample survey data. An extension of the validation of diagnostic information would consist of using the data from record sources to provide more reliable information concerning conditions reported in the survey. To obtain certain types of information—for example, diagnostic detail for neoplasms reported in the survey—it would be necessary to refer to medical sources.

Two other uses of record sources not examined specifically in the San Jose Survey will be discussed. These include the use of auxiliary sources (*a*) to provide estimates for relatively rare characteristics and (*b*) to provide greater detail for certain geographic areas or population groups.

Estimates for Rare Characteristics

A household sample survey will not provide extensive information for relatively rare conditions, unless special steps are taken in the survey design. However, where an incomplete list of relatively rare conditions is available from existing records, it is possible to use the survey to supplement the record data by detecting cases not available in the records. For example, if one had reason to think that reports of measles from a record source were incomplete, it would be possible to combine properly verified sample survey reports of measles not reported in the record source to construct an estimate of the incidence of measles in the population.

Joint use of incomplete record data and sample survey information may make it possible to provide statistics for relatively rare events with a precision comparable to that of more frequently occurring conditions. Statistical theory is available to guide this method of joint use of record data with area sampling to yield estimates of the rare characteristics with specified precision (*17a*).

Greater Detail for Geographic Areas

A promising avenue of exploration is the use of sample survey information to provide a continuing calibration of local data from other more limited sources. This method may be used when "one wishes to prepare estimates for a number of individual areas on the basis of direct measures of the desired characteristics for only a sample of these areas, together with a knowledge of some related characteristic for each individual area" (17*b*). The utility of this method depends on the strength of the correlation between the expected values of the sample survey results and the related information available from a different source for the individual areas.

One might, for example, use reports of acute communicable disease from limited geographic areas within a state, combined with survey data from a sample of these areas, to provide estimates of the direct measure used in the survey for each of the limited geographic areas

Appendix A. Reliability of Estimates

The problems investigated in this monograph are sources of nonsampling errors such as ambiguities in questionnaire construction, interviewer variability, and respondent bias and variability. Such errors, of course, are present in all surveys, whether based on samples or total populations. The use of samples means that the resulting statistics are subject to sampling variability and will differ somewhat from the figures that would have been obtained if the investigation had covered an entire population.

The standard error is primarily a measure of sampling variability, although as calculated in this report it reflects some of the nonsampling error as well. Assume that it were possible to cover the entire population from which the sample was drawn, using the same questionnaire, instructions, interviewers, and procedures. Such a complete count would produce figures within 1 standard error of the sample estimate for about 2 out of 3 of the independent statistics shown and within 2 standard errors of the sample estimate for about 19 out of 20 of such statistics.

Standard Errors for Estimates in Data Tables

The guide to the use of standard error tables A–1 through A–8 designates which of these tables should be used in obtaining standard errors for most of the estimates in the tables of statistical data in the present report. Standard errors are entered in tables A–1 through A–8 according to a range of values of rates or percentages and according to a range of relative sizes of ratio denominators. In most of the tables of statistical data the relative sizes of ratio denominators are given in the line or column headed "measure of sample size." For statistics in the data tables with values or relative sizes between those shown on the standard error tables, the estimated standard errors may be obtained through linear interpolation. In view of the number of approximations involved in estimating the standard errors, the tables should be thought of as providing an estimate of approximate standard error rather than as the precise standard error for any specific rate or percentage.

Guide to Use of Standard Error Tables A–1 Through A–8 for Estimates in Data Tables

Data table No.	*Variable*	*Standard error table No.*
1–3	Illness prevalence	- - -
4–6	Chronic conditions	- - -
7	Illness prevalence	- - -
8	Chronic conditions	- - -
9	Incidence rates based on 1-month recall period	A–2
	Days of restricted activity and bed disability based on 1-month recall period	A–3
	Incidence rates and days of restricted activity and bed disability based on 1-day recall period	[1] A–1
10	Reports of illness	A–1
11	Incidence rates	A–2
	Ratios of rates	- - -
12	Incidence rates	A–5
	Ratios of rates	- - -
13	Hospital admissions	[2] s.r.s.
14	Persons	A–1
15	Incidence rates	A–2
	Persons	A–1
16	Persons	A–1
17	Incidence rates based on diaries and 1-month recall period	A–2
	Days of illness, without and with activity restriction, with bed disability, based on diaries and 1-month recall period	A–3
	Incidence rates, days of illness without and with activity restriction, with bed disability based on 1-day recall period	[1] A–1
18	Incidence rates: San Jose	A–2
	Incidence rates: California Health Survey	A–5
19	Incidence rates	A–2
20	Persons	A–4
21	Households	A–4
22	Households	A–4
23	Incidence rates	A–5

See footnotes on p. 94.

Data table No.	*Variable*	*Standard error table No.*
24	Days of restricted activity and bed disability	– – –
	Chronic condition rates	A–5
25	Incidence rates	A–5
	Ratios of rates	– – –
26	Incidence rates	A–5
	Ratios of rates	– – –
27–28	Persons	A–1
29	Percent of total "days in sample"	– – –
30–32	Households	A–1
33	Incidence and chronic condition rates	A–2
	Days of restricted activity and bed disability	A–3
	Persons	A–1
34	Incidence rates	A–2
	Days of illness, without and with activity restriction, and with bed disability	A–3
35	Incidence rates	A–2
	Days of restricted activity and bed disability	A–3
	Persons	A–1
36	Incidence rates	A–2
	Persons	A–1
	Ratios of rates and percentages	– – –
37	Incidence rates	A–2
	Ratios of rates	– – –
38–39	Reports of medically attended illness	– – –
40	Chronic condition rates	A–2
	Percentages of rates	– – –
41	Chronic condition rates	A–7
42	Incidence rates	A–2
	Net differences and other percentages of illnesses	– – –
43	Reports of medically attended illness	– – –
44	Persons: California Health Survey	A–4
	Persons: Post Enumeration Survey	A–6
45	Persons	A–6
46	Morbidity rates	A–7
	Net differences	A–8
47	Total condition rates	A–7
	Net differences and other percentages of conditions	A–8
	Percent disagreement	– – –
48	Total condition rates	A–7
	Net differences and other percentages of conditions	A–8
49	Total condition rates	A–7
	Net differences and underreports	A–8
	Persons	A–6
50	Total condition rates	A–7
	Net differences and underreports	A–8
51–52	Selected morbidity measures	– – –
53	Incidence rates	A–7
	Net differences and other percentages of illnesses	A–8

Data table No.	*Variable*	*Standard error table No.*
54	Days of restricted activity and bed disability	– – –
	Net differences and other percentages of days	– – –
	Chronic condition rates	A–7
	Net differences and other percentages of chronic conditions	A–8
55	Overreports	A–8
56	Incidence rates	A–7
	Net differences and other percentage of illnesses	A–8
	Percent disagreement	– – –
57	Chronic condition rates	A–7
	Net differences and other percentages of chronic conditions	A–8
	Percent disagreement regarding chronic conditions	– – –
	Days of restricted activity and bed disability	– – –
	Net differences and other percentages of days	– – –
	Percent disagreement regarding days	A–6
58	Incidence rates	A–7
	Ratios of rates	A–8
59	Underreports	A–8
60	Persons	A–6
61	Incidence rates	A–7
	Net differences and other percentages of chronic conditions	A–8
62–64	Chronic condition rates	A–7
	Net differences and other percentages of chronic conditions	A–8
65	Persons	– – –
66	Interviewer ranks	[3]s.r.s.
67	Chronic condition rates	A–5
	Underreports	A–8
68	Hospital admissions	[2] s.r.s.
69	Measures of hospitalization	– – –
70–71	Reports of diagnoses	[2] s.r.s.
D–1	Persons	– – –
D–2	Households	A–1
D–3	Persons	A–4
D–4	Persons	A–4
	Days of restricted activity	– – –
D–5	Persons	A–6
F–1—F–4	Persons	A–1
F–5—F–7	Incidence rates	A–2

[1] As the data table rates are the 1-day recall period rates multiplied by 30 to obtain monthly rates, divide the data table rates shown by 30 and obtain the standard error from table A–1. Multiply the resulting standard error by 30 to apply to the adjusted rates shown in the data table.

[2] Calculate standard errors under simple random sampling assumptions, using the number of cases shown on data table.

[3] Significance of ranks tested using Kendall's *tau* under simple random sample assumptions. See text discussion of table 66.

Table A-1. Standard error of estimated percentages of persons and households: San Jose

Estimated percentage	Measure of size of percentage base								
	1	2	4	8	17	33	67	83	100[1]
0.5 or 99.5	0.8	0.6	0.4	0.3	0.2	0.1	0.1	0.1	0.1
1.5 or 98.5	2.0	1.4	1.0	.7	.5	.3	.2	.2	.2
2.5 or 97.5	2.8	2.0	1.4	1.0	.7	.5	.4	.3	.3
5 or 95	4.6	3.2	2.2	1.6	1.1	.8	.6	.5	.5
10 or 90	7	5	3	2	1.7	1.2	.9	.8	.7
25 or 75	10	7	5	4	2	1.8	1.3	1.2	1.0
50	11	8	6	4	3	2	1.4	1.2	1.1

[1] Corresponds to about 6,000 persons.

Table A-2. Standard error of estimated rates of illness and chronic conditions: San Jose

Estimated rate	Measure of size of base of rate								
	1	2	4	8	17	33	67	83	100[1]
0.1	0.4	0.3	0.2	0.1	0.1	0.07	0.05	0.04	0.04
0.5	.9	.6	.4	.3	.2	.2	.1	.1	.1
2.5	3.2	2.4	1.6	1.2	.8	.6	.4	.4	.3
5	5.0	3.8	2.6	1.8	1.3	.9	.6	.6	.6
10	8	6	4	3	2	1.5	1.0	.9	.8
20	13	9	6	5	3	2	1.6	1.4	1.3
30	17	12	8	6	4	3	2	1.8	1.7
50	20	14	10	7	5	3	2	2	2
75	20	14	10	7	5	3	2	2	2
90	19	14	10	7	5	3	2	2	2

[1] Corresponds to about 6,000 persons.

Table A-3. Standard error of estimated rates involving days of illness without and with restricted activity and days of bed disability: San Jose

Estimated rate	Measure of size of base of rate								
	1	2	4	8	17	33	67	83	100[1]
2.5	5.8	4.0	2.8	2.0	1.4	1.0	0.7	0.6	0.6
5	9.0	6.0	4.2	3.0	2.2	1.5	1.0	1.0	.8
10	14	10	7	5	4	2	1.8	1.6	1.4
20	24	18	12	9	6	4	3	3	2
30	36	26	18	13	9	6	4	4	4
50	47	34	23	16	12	8	6	5	5
100	57	40	28	20	14	10	7	6	6
150	70	50	34	24	18	12	9	8	7
200	74	52	36	26	18	13	9	8	8

[1] Corresponds to about 6,000 persons.

Table A-4. Standard error of estimated percentages of persons and households: California Health Survey

Estimated percentage	Measure of size of percentage base									
	0.5	1	2.5	5	10	15	25	50	75	100[1]
0.5 or 99.5	0.7	0.5	0.3	0.2	0.2	0.1	0.1	0.07	0.06	0.05
1.5 or 98.5	1.2	.8	.5	.4	.3	.2	.2	.1	.1	.08
2.5 or 97.5	1.7	1.2	.8	.5	.4	.3	.2	.2	.1	.1
5 or 95	2.3	1.7	1.0	.8	.6	.4	.3	.2	.2	.2
10 or 90	3	2	1.4	1.0	.7	.6	.4	.3	.3	.2
25 or 75	5	4	2	2	1.1	1.0	.7	.5	.4	.4
50	7	5	3	2	1.6	1.3	1.0	.7	.6	.5

[1] Corresponds to about 30,000 persons.

Table A-5. Standard error of estimated rates of illness and chronic conditions: California Health Survey

Estimated rate	Measure of size of base of rate									
	0.5	1	2.5	5	10	15	25	50	75	100 [1]
0.5	0.7	0.5	0.3	0.2	0.2	0.1	0.1	0.07	0.06	0.05
1.5	1.3	.9	.6	.4	.3	.2	.2	.1	.1	.1
2.5	1.7	1.2	.8	.6	.4	.3	.3	.2	.1	.1
5	2.6	1.8	1.2	.8	.6	.5	.4	.3	.2	.2
10	4	3	1.7	1.2	.8	.7	.5	.4	.3	.3
20	5	4	2	1.7	1.2	1.0	.7	.5	.4	.4
30	7	5	3	2	1.5	1.2	.9	.7	.5	.5
50	8	6	4	3	1.8	1.5	1.2	.8	.6	.6
100	13	10	6	4	3	2	1.9	1.3	1.1	1.0
150	16	12	8	5	4	3	2	1.6	1.4	1.2

[1] Corresponds to about 30,000 persons.

Table A-6. Standard error of estimated percentages of persons: California Health Survey PES

Estimated percentage	Measure of size of percentage base							
	2.5	5	10	15	25	50	75	100 [1]
1.5 or 98.5	3.3	2.4	1.6	1.3	1.0	0.7	0.6	0.5
2.5 or 97.5	4.2	3.0	2.1	1.7	1.3	.9	.8	.6
5 or 95	6.0	4.2	3.0	2.4	1.8	1.3	1.0	1.0
10 or 90	8	6	4	3	3	1.9	1.5	1.3
25 or 75	13	9	6	5	4	3	2	2
50	18	13	10	8	6	4	3	3

[1] Corresponds to about 1,000 persons.

Table A-7. Standard error of estimated rates of illness and chronic conditions: California Health Survey PES

Estimated rate	Measure of size of base of rate							
	2.5	5	10	15	25	50	75	100 [1]
1.5	3.3	2.4	1.6	1.3	1.0	0.7	0.6	0.5
2.5	4.2	3.0	2.1	1.7	1.3	.9	.8	.6
5	6.0	4.2	3.0	2.4	1.8	1.3	1.0	1.0
10	8	6	4	3	3	1.9	1.5	1.3
20	12	8	6	5	4	3	2	2
30	15	10	8	6	5	3	3	2
50	18	13	10	8	6	4	3	3
100	35	25	17	14	11	8	6	6
150	50	34	26	20	16	11	9	8
250	70	50	35	28	22	16	12	11

[1] Corresponds to about 1,000 persons.

Table A-8. Standard error of estimated percentages of illness and chronic conditions: California Health Survey PES

Estimated percentage	Measure of size[1] of percentage base								
	1.0	2.5	5	10	15	25	50	75	100[2]
1.5	9. 4	6. 0	4. 2	3. 0	2. 4	2. 0	1. 4	1. 1	0. 9
2.5	12	7. 8	5. 5	4. 0	3. 2	2. 5	1. 8	1. 4	1. 2
5	16	10	7. 5	5. 5	4. 4	3. 4	2. 4	2. 0	1. 7
10	21	13	10	7	6	4	3	2	2
20	26	17	12	8	7	5	4	3	3
30	33	21	15	10	9	7	5	4	3
50	44	28	20	14	12	9	7	6	5
75	58	38	27	19	15	12	8	7	6
100	67	42	30	21	18	14	10	8	7
200	106	68	48	34	28	22	15	12	11

[1] For any given morbidity category in the data tables, the measure of sample size for "all persons" may not equal the sum of the measures of sample size for "adult reporters," "children," and "adult nonreporters." As a uniform procedure in all PES data tables, measures of sample size for "all persons" were estimated from figures weighted inversely as the within-household sampling rates. See pt. I, sec. 6, "Post Enumeration Survey."

[2] Corresponds to about 1,300 original interview morbidity conditions.

Approximation of Standard Errors

Random group methods were used in estimating standard errors for both the San Jose and California Health Surveys. (See reference *17c* for a general discussion of random group methods.) Since estimates were needed for a wide variety of classes of statistics, the use of random groups resulted in considerably less work and lower cost, as compared with the calculation of more exact estimates. In the San Jose Survey, the 20 interviewer assignment groups were treated as random groups, with appropriate modifications to account for the stratification of the sample. Since a single assignment group was usually handled by one interviewer, the calculated standard error contains a component reflecting interviewer variance.

In the California Health Survey, each weekly subsample was treated as a random group. To eliminate most of the effects of seasonal fluctuations, a variation of the random group method was used, involving differences between successive pairs of sample weeks. This grouped-stratum technique treated each pair of sample weeks as a stratum from which two random groups were available (*17d*).

It was not possible to compute an estimated standard error for each of the statistics dealt with in this report. For each of the three basic types of samples—San Jose, California Health Survey, and Post Enumeration Survey—variances were computed for the various classes of ratios used in this report. For each class, ratios were selected which covered a wide range of values from low to high and a range of denominators. Previous experience had indicated that for a given class of ratios the estimated variance for a member of the class tended to have a definite functional relationship to the value of the ratio and to the "size" of the ratio denominator. For each of the classes of ratios and each of the three samples, the product of ratio denominator × (coefficient of variation of the ratio)[2] was plotted against the ratio on a semilogarithmic grid. A smoothed curve was drawn through the class or classes of items which appeared to exhibit the same functional relationships. These smoothed curves formed the basis for constructing a series of tables in which standard errors are entered according to selected spaced values of the ratios and of relative sizes of ratio denominators.

Standard Errors for Differences Between Estimates

The standard error of a difference between two sample estimates may be obtained by taking the square root of the sum of the squares of the standard error of each estimate. This relationship is exact only if the two estimates are uncorrelated, and for positively correlated estimates it leads to too large a measure. The experimental groups in both the San Jose and California Health Surveys were selected in such a manner as to take advantage of the correlation between households within segments; sample estimates involving two or more such groups are positively correlated. There is also a positive correlation between most other estimates compared, such as reports at original interview and reinterview. Hence, for most of the estimates compared in this report, the procedure produces too large a measure of the standard error of a difference, resulting in conservative tests of statistical significance.

In practice, the 5 percent level was used in testing for most of the significant differences discussed in this report. However, we have not hesitated to point out cases where a given set of differences is in a consistent direction, even though the individual differences may not exceed twice their standard error.

Problems of Nonstatistical Inference

We use standard errors to make statistical inferences about the population from which the sample was drawn, assuming that a population survey had been conducted at the same time period in exactly the same manner. In practice, of course, we usually wish to extend the results to a present or future time period. Also, we would like to make inferences about different populations, using different survey procedures and personnel. From a statistical standpoint, the extent to which a relationship is constant is an empirical question which can be resolved only by examining different populations at different times in different places using different procedures. In practice, of course, the researcher must often make such extensions of inference without repeating the original experimental design. If this process cannot be guided by the rigid canons of statistical inference, it must rest on informed judgment. Such judgments have entered into the suggestions for further research included at the close of many sections of this report. Some of the findings, in our opinion, cannot be assumed to apply in other situations, and we have suggested that certain of the experimental objectives be repeated. Other experimental findings, in our judgment, would probably recur if the experiments were repeated in different populations, so we have suggested some additional stages of research.

Appendix B. Definition of Terms

This section contains a classified listing of certain of the morbidity and methodological terms used in the present report. In general, it covers only those terms which occur repeatedly. It does not include terms used in a limited portion of this report, when they are specifically defined in that portion, or those in wide usage, unless they have been given a specialized meaning in this report.

Some terms are used only in the San Jose Survey, others only in the California Health Survey, and others are common to both. Where there are differences in the technical definitions of terms common to both surveys, the definition used in each survey is listed.

GENERAL MORBIDITY

A morbidity condition, or simply a condition, is any entry on a questionnaire or diary which describes a departure from a state of physical or mental well-being. Conditions are classified according to a number of different criteria, such as whether they were medically attended and whether they caused illness or disability. These axes of classification are discussed below.

Chronic condition, in general, embraces a wide variety of impairments and other deviations from the normal which are relatively long term. Such a condition does not always cause illness.

San Jose Survey. Chronic conditions are those having the following codes in the sixth revision of the International Statistical Classification of Diseases, Injuries, and Causes of Death: 001–019, 020–029, 046–048, 140–239, 240–241, 244–245, 250–254, 260, 270–277, 280–289, 290–299, 300–326, 330–334, 344–345, 350–357, 360–369, 380–389, 395–398, 400–447, 450–456, 460–468, 502, 510–527, 540–545, 553, 560–561, 572, 574, 577, 581, 583–586, 592, 594, 603, 606, 609, 610, 612–613, 616–617, 620, 623, 625, 631–633, 636–637, 700–716, 722–727, 730–738, 744–749, 750–758, 759, 794. In addition, residuals of injuries (ISC Codes 800–996) of "long duration" are considered chronic conditions.

California Health Survey. A condition is considered chronic if (*a*) it was reported in response to one of the chronic condition recall questions (Q. 14-16), or (*b*) it is described in terms of one of the chronic diseases on the chronic conditions list, or (*c*) it was first noticed more than 3 months before the week of interview, or (*d*) it is considered to cause "chronic or repeated trouble."

Illness is a period when an individual affected by a morbidity condition considers himself to be "sick" or "injured." (For the specific questions used to elicit reports of illness, see part I, section 1.)

Chronic illness is an illness caused by a chronic condition. Since the definitions of chronic conditions in the San Jose and California Health Surveys were not the same, the definitions of chronic illness are not identical. (See definitions of "chronic condition" for the two surveys.)

Acute illness is any illness not caused by a chronic condition.

Incidence of illness is the estimated number of illnesses having their onset in a specified time period. For convenience in making methodological comparisons, most incidence rates are expressed on a calendar-month basis for the San Jose Survey and on a 4-week basis for the California Health Survey.

Prevalence of conditions is the estimated number of conditions of a specified type existing during a specified period of time. It is usually discussed on a 4-week or calendar-month basis.

Total conditions include illnesses existing during the 4-week recall period ("4-week prevalence of illness") together with all those chronic conditions not causing illness in the 4-week recall period. This category is used for some methodological analyses in the California Health Survey, but has no utility in substantive health investigations.

Medically attended chronic condition is a condition for which a physician was consulted at its onset or at any time thereafter.

Medically attended illness was defined somewhat differently in the two surveys:

San Jose Survey. A medically attended illness is an illness for which a physician was consulted during the period of illness.

California Health Survey. A medically attended illness is an illness for which a physician was consulted during the period of illness, if the consultation occurred within the 4-week recall period.

For illness incidence, the definitions of medical attendance in the two surveys are identical. For illness prevalence the San Jose definition is somewhat broader than the California Health Survey definition, since it counts as "medically attended" those illnesses for which a physician was consulted prior to the start of the calendar-month recall period.

Activity-restricting illness is an illness which caused part of 1 day or more of restricted activity during the recall period. (See definition of "restricted-activity day.")

Bed-disabling illness is an illness which caused at least part of 1 day's confinement to bed during the recall period. (See definition of "bed-disability day.")

DAYS OF DISABILITY

Disability is a general term used to describe any temporary or long-term reduction of a person's activity as a result of an illness or chronic condition. Disability days are classified according to whether they are days of restricted activity or bed-disability days. All bed-disability days are, by definition, days of restricted activity. Whenever a person had a day of disability because of several illnesses, a proportion of the day was assigned to each illness.

Restricted-activity day is a day when a person cuts down on his usual activities for all or part of the day because of illness or injury. The term "usual activities" for any day means the things a person would ordinarily do on that day.

Bed-disability day is a day in which a person was kept in bed all or part of a day because of illness or injury. All hospital days are included as bed disability days even if the patient was not actually in bed at the hospital.

INTERVIEW PROCEDURES

Initial interview is the first interview for each of the San Jose Survey experimental groups.

Repeat interview refers to each of three interviews conducted at monthly intervals following the initial interview of one of the San Jose Survey experimental groups (group II).

Initial diary is one kept by some of the San Jose Survey experimental groups for the balance of a month following the date of initial interview.

Repeat diary is one kept for a month at a time by some of the San Jose Survey experimental groups in months following the completion of the initial diary.

Reinterview sample is a subsample from the San Jose Survey of adults not responding for themselves, who acted as self-respondents at reinterview.

Calendar-interview group is a subsample of California Health Survey households having mailable addresses to which health calendars were mailed in advance of the 4-week recall period, with the request that a household member make daily entries of the health status of all household members. This calendar was intended to aid in illness recall at interview.

Interview-only group is the control group for the calendar-interview group. It received a California Health Survey interview only.

Post Enumeration Survey (PES), covering a subsample of California Health Survey addresses, checked that the original interview was conducted at the correct address and that the dwelling unit definition and definitions for whom to count as household members were correctly applied. In addition, a reinterview was conducted with all adults who had not responded for themselves originally, with half of the adults who had responded for themselves originally, and for half the children who had originally been covered.

Original interview designates the interview conducted with that part of the California Health Survey sample covered by the Post Enumeration Survey.

Reinterview is the Post Enumeration Survey interview using the same questions and referring to the same time period covered by the original interview.

Independent reinterview subsample is a subsample of the Post Enumeration Survey in which all the questions were reasked and the responses recorded independently, without reference to the original interview questionnaire. After the entire reinterview was completed, the reinterview responses were reconciled with the original interview responses.

Dependent reinterview subsample is a subsample of the Post Enumeration Survey in which only questions regarding the existence of illnesses and chronic conditions were to be asked independently. The detailed information about each condition, copied from the original interview questionnaire, was then checked by asking again the detailed questions, comparing the reinterview response with the previously copied original interview information, and reconciling any discrepancies.

REINTERVIEWING PROCESS

Independent reinterview is a reinterview obtained before the respondent or reinterviewer had access to the original interview responses. The San Jose reinterview sample was given an independent reinterview.

Reconciled reinterview consists of the responses selected by the reinterview respondent as most correct, after he had been told of any discrepancies between the responses made at independent reinterview and at original interview.

Independent overreport is a condition reported at original interview but not at independent reinterview.

Independent match is a condition reported both at original interview and at independent reinterview.

Independent underreport is a condition reported at independent reinterview but not at original interview.

Reconciled overreport is a condition reported at original interview but not at reconciled reinterview. The category includes only those independent overreports which, according to the reinterview respondent, should not have been reported at original interview.

Reconciled match is a condition reported both at original interview and at reconciled reinterview. The category consists of all independent matches together with those independent overreports which, according to the reinterview respondent, should have been reported at original interview.

Reconciled underreport is a condition reported on the reconciled reinterview but not on the original interview. The category includes only those independent underreports which, according to the reinterview respondent, should have been reported at reinterview (despite the fact that they were not reported at original interview).

RESPONDENT TYPE

Reporter is an adult self-respondent.

Nonreporter is any adult not available for direct interview for whom a reporter responded, or a child. (In the San Jose reinterview sample and the Post Enumeration Survey, where all original interview adult nonreporters were self-respondents at reinterview, the respondent type in the data tables refers to the original interview classification.)

Proxy respondent is any reporter who responded for one or more nonreporters.

QUESTION TYPE

Standard questions are San Jose Survey interview questions 38–45, inquiring in general terms about illness, accidents, hospitalization, and chronic conditions. Unless otherwise indicated, San Jose morbidity data tables contain information elicited by standard questions only.

Supplemental questions are San Jose Survey repeat interview questions 57–59 and 61, relating to medical care for illness and symptoms of illness and chronic conditions.

LENGTH OF RECALL PERIODS

One-day recall period is the period of inquiry covered by San Jose Survey questions referring to illness on the day preceding the day of interview.

Calendar-month recall period is the period of inquiry covered by San Jose Survey questions referring to illness during the calendar month preceding the month of interview.

Four-week recall period is the period of inquiry covered by California Health Survey questions referring to illness during the 4 calendar weeks preceding the week of interview. The 4-week recall period is often referred to as a "month" in the text and data tables.

Appendix C. Statistical Design

San Jose Survey

The San Jose Survey was based on an area sample of 400 segments, each segment having an expected size of six households. The entire area, consisting of the city and an adjacent rural area, was divided into three strata, within each of which interviewer assignments were randomized (fig. 14). (Data from the rural area outside the city are included in statistics dealing with household survey methods, but are excluded from statistics dealing with the uses of data from medical record sources.)

The strata were as follows:

Stratum A: Three assignments, each consisting of 10 segments within the city and 10 segments outside the city.

Stratum B: Two assignments, each consisting of 10 segments within the city and 10 segments outside the city.

Stratum C: Fifteen assignments, each consisting of 20 segments within the city.

All addresses in the sample segments were listed, following the procedures used in the Bureau of the Census' Current Population Survey. In order to investigate alternate household survey techniques, the addresses in the listed segments were randomly assigned to six experimental groups, or subsamples, with all households at a given address being assigned to the same experimental group. (See discussion of figures 1 and 2 in the introduction to this report.) Members of the armed forces, the institutional population, and nonresidents temporarily in the area were excluded from the sample.

In view of the manner in which the segments were assigned to experimental groups, the sample for any one group was roughly equivalent to a random sample of households, since the segments for any one group would contain about one household, on the average. Comparisons between households were essentially on a within-segment basis. This type of design was intended to take advantage of the expected correlation between households within segments. The effect of such correlation would be to reduce the variance of differences between experimental groups over that which would have been obtained if the subsamples had been selected independently. This correlation does not, however, significantly affect estimates constructed for any one of the groups.

California Health Survey

The sample of persons enumerated in the California Health Survey, conducted between the week of April 5, 1954, and the week of April 18, 1955, represented the entire population of the State of California, exclusive of persons residing on military installations. For the tabulations in this monograph, inmates of institutions were omitted as well (because the collection and interpretation of morbidity data for the institutional population presents certain problems not commonly encountered in the noninstitutional population). Somewhat different procedures were used in the selection of the sample for different segments of the population. The sample data were obtained by collecting information for all persons in a sample of households and a sample of persons in selected special dwelling places (including institutions). The samples were selected in such a manner that they resulted in a uniform overall sampling rate of 1 in 385. For purposes of enumeration, the sample was divided into 52 equal subsamples, and a different subsample was enumerated during each week of the survey year. Consequently, each week's enumeration was based on a sample of 1 in 20,020. (During a 12-week period, weeks 27–38, the sampling rate was 2 in 20,020 in Los Angeles County.) Occasionally, individual segments were subsampled at the rate of 1 in 2, 3, or 4. The estimation procedure took account of these special cases in order to produce unbiased estimates.

Basis of Stratification. Prior to the selection of the sample, the entire area of California was divided into six strata:

1. Areas containing dwelling units with acceptable addresses listed on the 1950 Census of Population and Housing schedules or on more recent special census schedules were delineated. Dwelling units in these areas, included in the 1950 or later census, constituted the first stratum.

2. Living quarters in the areas described above which came into existence after the time of the census or were missed in the census. This stratum is referred to as the supplemental block stratum.

3. Rural-type areas for which addresses were not listed in sufficient detail on the census schedules to be used as a basis for sampling. Subdivisions of these areas are referred to as the rural segments.

4. Institutions included on a special list of institutions supplied by the California Department of Health.

5. Special dwelling places which existed at the time of the census, normally consisting of hotels, lodging houses, trailer camps, dormitories, labor camps, and the like, but also including institutions not on the special list.

6. Areas in which extensive new construction had taken place since the 1950 census or the period of the special census, if this was used as the basic sampling medium. All dwelling

places in such areas were deleted from the other strata in order to eliminate duplication of the chance of selection of the same unit for the sample.

Selection of Sample Within Each Stratum. Throughout most of the State, a systematic sample of clusters of an expected 18 units was selected at the rate of 1 in 6 times 385. The census schedules were examined in all census enumeration districts (E.D.'s), and each E.D. was classified as having good addresses or poor addresses. (An enumeration district is an area, containing on the average 250 households, which was generally used as an assignment for a single enumerator in the 1950 census or special census.) The better address group became the stratum of census addresses, and the sample clusters comprised 18 neighboring addresses selected from these E.D.'s. These addresses were then subsampled at the rate of 1 in 3 to obtain the stratum of rural segments; in this stratum E.D.'s which contained sample clusters were segmented (divided into small land areas surrounded by definable physical boundaries), and sample segments were designated for the enumeration. Sampling instructions which would result in the selection of an expected six units were assigned to each sample rural segment.

In the supplemental block stratum, blocks were sampled with equal probability since there was no knowledge of the number of sample units that might result from the individual blocks. However, the expected number of sampling units per block was about one. Households or other living quarters within these blocks were to be enumerated if they were not included in the 1950 census or later special census used for the sample of addresses. Such households were identified by comparing the units currently in each block with a list of those units enumerated within the block at the time of the census.

A preliminary survey of new construction in the entire State was conducted simultaneously with the sample selection in other strata and prior to the enumeration, leading to the identification of a set of blocks containing a high proportion of units constructed since the last census. As part of the preliminary survey an estimate was made of the number of dwelling units in each block in the stratum. A sample of these blocks was then selected with probability proportionate to size, the size being the estimated number of dwelling units. Within each sample block all living quarters were listed and a sample selected for enumeration. Samples were selected at such a rate as to provide an expected number of six dwelling units or other living quarters to be enumerated per sample block and to result in a uniform overall sampling fraction.

A sample of institutions and other special dwelling places was selected with probability proportionate to size, the measure of size being the number of persons enumerated in the dwelling place in 1950 census or special census, or for institutions, the capacity (both inmates and staff) reported by the California Department of Health. The institutions and special dwelling places were then subsampled to produce an expected "take" of about six units (a unit could have been a room, bed, person, etc.) and a uniform overall sampling rate.

When the selection of the sample was completed, the sample clusters were arranged systematically into 52 groups. These groupings were performed independently for each stratum. The 52 groups were then arranged in random order, and the resulting order of the groups gave the order of the week during which interviewing was scheduled to be performed for that group.

Deviations From General Design. There were a number of deviations from the sample design described above. During the 12-week period, weeks 27–38, the sampling rate used in Los Angeles County was 2 in 20,020 as compared with 1 in 20,020 used during each week in the rest of the State and in Los Angeles County during the other 40 weeks of the year. This increase in the sample size was accomplished by selecting a new and completely independent sample in Los Angeles County. The same principles of selection were used for the supplemental sample as for the sample in the rest of the State.

There were additional differences in the details of sample selection for the greater part of the sample in Los Angeles City and in most of the remainder of the county. In the San Diego and Bakersfield areas the cluster sizes were about four households (or other units in special dwelling places and institutions) instead of six.

Post Enumeration Survey

In general, the sample for the Post Enumeration Survey was based on a sample of one-fourth of the segments in the California Health Survey and a sample of one-third of the sample addresses within the selected segments. (In the case of supplemental blocks, one-twelfth were selected, and all units included in the California Health Survey were included in the Post Enumeration Survey.)

SUBSAMPLING OF ADDRESSES FOR REINTERVIEW. The above sampling procedure led to an average of two sample addresses to be reinterviewed per segment in the Post Enumeration Survey. A few of the original segments were unusually large and the number of sample addresses designated for reinterview was greater than five. In these segments the addresses for reinterview were subsampled as follows:

Number of addresses designated in sample for reinterview	*Number of addresses in subsample*
6–10	½
11–15	⅓
16 and over	¼

Because of demands on the time of supervisory personnel, it was not possible to start the reinterviewing until the 12th sample week of the California Health Survey.

For each sample address designated for the Post Enumeration Survey, a reinterview was conducted for all households originally interviewed at that address. The reinterview included all adults who did not respond for themselves in the original interview and a sample of half the other members of the household—adults who originally responded for themselves and children.

Appendix D. General Qualifications

Coverage

One objective of the Post Enumeration Survey was to measure the error in coverage of the population in the California Health Survey arising out of errors in listing and sampling, failure to interview at the correct address, and errors in the definition of the dwelling unit and in determining the household membership. These determinations were made by supervisory personnel, based on the Post Enumeration Survey sample. As shown in table D–1, 2.2 percent of the persons in the California Health Survey were erroneously included, while 3.1 percent were erroneously excluded. Thus, the net proportion of persons missed was almost 1 percent.

There was no coverage check in the San Jose Survey.

Nonresponse

SAN JOSE SURVEY. The sampling procedure described in appendix C resulted in about 400 households per subsample eligible for inter-

Table D–1. Overreported and underreported persons, as a percentage of all persons originally interviewed, by type of miscount: California Health Survey PES, July 1954–April 1955

Overreported—erroneously included on original interview		Underreported—erroneously excluded on original interview	
Type of miscount	Percent	Type of miscount	Percent
All overreported persons	2.2	All underreported persons	3.1
Correct dwelling unit, but some occupants not household members	0.5	Correct dwelling unit, but some household members missed	1.0
Erroneously included households	1.7	Missed households	2.1
Original interview at wrong address	1.5	Original interview at wrong address	.8
Correct address, but all occupants nonresidents	.1	Correct address erroneously reported vacant or with dwelling units missed	1.3
Error in original listing	.1	Omitted from original listing	.1

Table D-2. Percentage distribution of households eligible for interview by reason for no interview, according to initial interview group: San Jose, February–June 1952

(Excludes dwelling units which were vacant or occupied entirely by nonresidents. Data are for the unweighted sample)

Reason for no interveiw	Initial interview group						
	All groups	I	II	III	IV	V	VI
All eligible households	100. 0	100. 0	100. 0	100. 0	100. 0	100. 0	100. 0
Completed interview	89. 7	92. 1	89. 5	88. 4	91. 0	89. 8	87. 1
No interview	10. 3	7. 9	10. 5	11. 6	9. 0	10. 2	12. 9
Not at home after 3 or more calls	5. 8	4. 3	6. 3	6. 4	4. 8	4. 4	8. 6
Temporarily absent	. 7	. 8	. 5	1. 5	. 2	. 5	. 3
Refusal	2. 4	1. 5	2. 1	2. 0	3. 0	3. 3	3. 4
No English spoken	. 4	. 3	1. 0	. 5	—	. 5	—
Too ill to be interviewed	. 6	. 5	. 3	1. 0	. 8	. 5	. 3
Other reasons	. 4	. 5	. 3	. 2	. 2	1. 0	. 3
Measure of sample size	*100*	*17*	*16*	*17*	*17*	*17*	*16*

view. As shown in table D–2, questionnaires were not obtained from 10 percent of the San Jose Survey households eligible for interview. For 6 percent of the households no one was found at home despite repeated calls, while 2 percent of the households refused to grant an initial interview. Nonresponse rates subsequent to the initial interview are presented in part I, section 5. Evidence in that section suggests that nonresponse probably had little effect on the methodological findings from the San Jose Survey.

California Health Survey. The reasons for failure to obtain interviews of persons eligible for interview in the California Health Survey are shown in table D–3. The noninterview rate was almost 4 percent. Refusals accounted for slightly more than 1 percent of persons eligible for interview.

In the event that it was not possible to complete the interview for all or part of the members of the household, the California Health Survey interviewers were asked to try to obtain from neighbors or relatives the names and personal characteristics of such noninterviewed persons. Personal characteristics included relationship to head of household, race, sex, age, marital status, and usual activity. This information was obtained for the majority of noninterviewed persons.

Noninterviewed persons were not comparable to the general population with regard to age and other characteristics. Since age and other demographic variables were known to be strongly related to morbidity, it was decided to substitute the morbidity experience of persons interviewed in the California Health Survey for persons who were not interviewed. In making the substitutions, interviewed persons with comparable personal characteristics living in the same general geographic area of the State were selected. In the event that no information was available for a noninterviewed household, the household substitute was selected at random from households interviewed in the same segment in which the noninterviewed household was located.

To justify this substitution procedure, one must assume that the morbidity experience of noninterviewed persons was like that of interviewed persons of comparable demographic status. Some information bearing on this

Table D-3. Percentage distribution of persons eligible for interview by reason for no interview: California Health Survey, May 1954–April 1955

Reason for no interview	Percent
All eligible persons	100. 0
Completed interview	96. 2
No interview	3. 8
Not at home after 3 or more calls	1. 0
Temporarily absent	. 6
Refusal	1. 3
Other reasons [1]	. 9
Measure of sample size	*100*

[1] Includes cases where it was not possible to locate the dwelling unit corresponding to the sample listing.

Table D-4. Percentage distribution of persons by type of conditions reported and days of restricted activity per 100 persons per month, comparing interviews completed late with the substitutions made for these same interviews prior to their eventual completion and with substitutions for interviews which were never completed: California Health Survey, May 1954–April 1955

Item	Late interviews [1]		Substitutions for interviews never completed
	Substitutions	Eventually completed	
	Percent distribution of persons		
Total	100	100	100
Persons reporting no conditions	36	38	31
Persons with chronic conditions but no illness in 4-week recall period	9	11	11
Persons with illness in 4-week recall period	55	51	58
With activity restriction	38	33	39
Without activity restriction	17	18	19
	Per 100 persons per month		
Days of restricted activity	163	190	194
Measure of sample size	*1.4*	*1.4*	*3.8*

[1] At the end of each calendar month, substitutions were made for all sample addresses which were noninterviews. A "late" interview is one for which a substitution was made but for which an interview was eventually completed following the close of the calendar month.

assumption is available. Substitutions for noninterviewed persons, using completed interviews for persons who were comparable with respect to age, sex, marital status, and work status, were made at monthly intervals. These monthly substitutions accounted for 5.2 percent of the persons covered by the survey. After the substitution had been made a completed interview sometimes was received. Such "late" interviews were received for 1.4 percent of the persons covered by the survey, leaving a final noninterview rate of 3.8 percent. Thus, for 1.4 percent of the persons it is possible to compare health status from substituted interviews with health status reported on the corresponding eventually completed interviews. Differences in selected morbidity characteristics between the two groups (table D-4) are not statistically significant. Although these findings cannot be extended to all noninterviewed persons, they do suggest that the substitution procedures were appropriate for one portion of noninterviewed persons, consisting mainly of those who were not at home at the times the interviewer made her original calls.

(A much more serious type of nonresponse is failure to account for the morbidity of persons dying during the recall period covered by the survey. An assessment of the effect of this

Table D-5. Percentage distribution of persons eligible for reinterview, including and excluding those not providing original interviews, by reason for no reinterview, according to original respondent type: California Health Survey PES, July 1954–April 1955

(Persons found on reinterview to have been underreported or overreported are excluded. See table D-1)

Reason for no reinterview	Persons eligible for reinterview							
	Including original noninterviews				Excluding original noninterviews			
	All respondent types [1]	Adult reporter	Nonreporter		All respondent types [1]	Adult reporter	Nonreporter	
			Child	Adult			Child	Adult
All eligible persons	100	100	100	100	100	100	100	100
Completed reinterview	92	90	96	91	94	93	98	92
No reinterview	8	10	4	9	6	7	2	8
Not at home after 3 or more calls	1	0	0	2	1	0	—	1
Temporarily absent	0	1	—	0	0	0	—	0
Refusal	4	5	2	4	3	3	1	3
Other reasons	3	5	1	3	3	4	1	3
Measure of sample size	*100*	*38*	*27*	*36*	*98*	*37*	*26*	*35*

[1] Figures are not weighted inversely as the sampling rate within households.

omission on survey-derived hospitalization rates has been made by Siegel and co-workers (*18*) using data collected for the San Jose Survey. Work on this problem has also been reported as part of the research program of the U.S. National Health Survey (*19*).)

Post Enumeration Survey. As described in appendix C, a Post Enumeration Survey was conducted with one-twelfth of the households in the California Health Survey sample, beginning with the 12th sample week. Within each PES household, an interview was conducted for all adults who had not responded for themselves originally and for one-half of the other household members. Persons for whom original interviews were not obtained were included in the PES sample, except those whose refusal had been followed up by the supervisory staff without success. However, no reinterviews were obtained for any of these persons, who constituted about 2 percent of the PES sample.

The reasons for failure to obtain reinterviews in the Post Enumeration Survey are listed in table D-5. Of all persons eligible, including those for whom no original interview was obtained, 8 percent failed to provide a reinterview. For persons for whom information was obtained at original interview, 6 percent did not provide a reinterview. Respondents for children granted a greater proportion of reinterviews than did the other two original respondent types.

For those persons for whom an original interview was obtained but a reinterview was not, another original interview and completed reinterview pair was substituted, using a person of the same respondent type, sex, work, and marital status, and with a similar age and geographic location. For those persons who were nonrespondents on both the original interview and the reinterview, similar substitution procedures were followed. (The rationale for making such substitutions is described in the discussions of tables D-3 and D-4.) These substitutions are included in the analyses from the Post Enumeration Survey appearing in this report.

Appendix E. Forms Used

Figure E-1. Initial questionnaire: San Jose Survey

The following pages show the exact content and wording of the initial questionnaire. The actual questionnaire was designed for a household as a unit and included additional space for reports on more than one person and more than one condition.

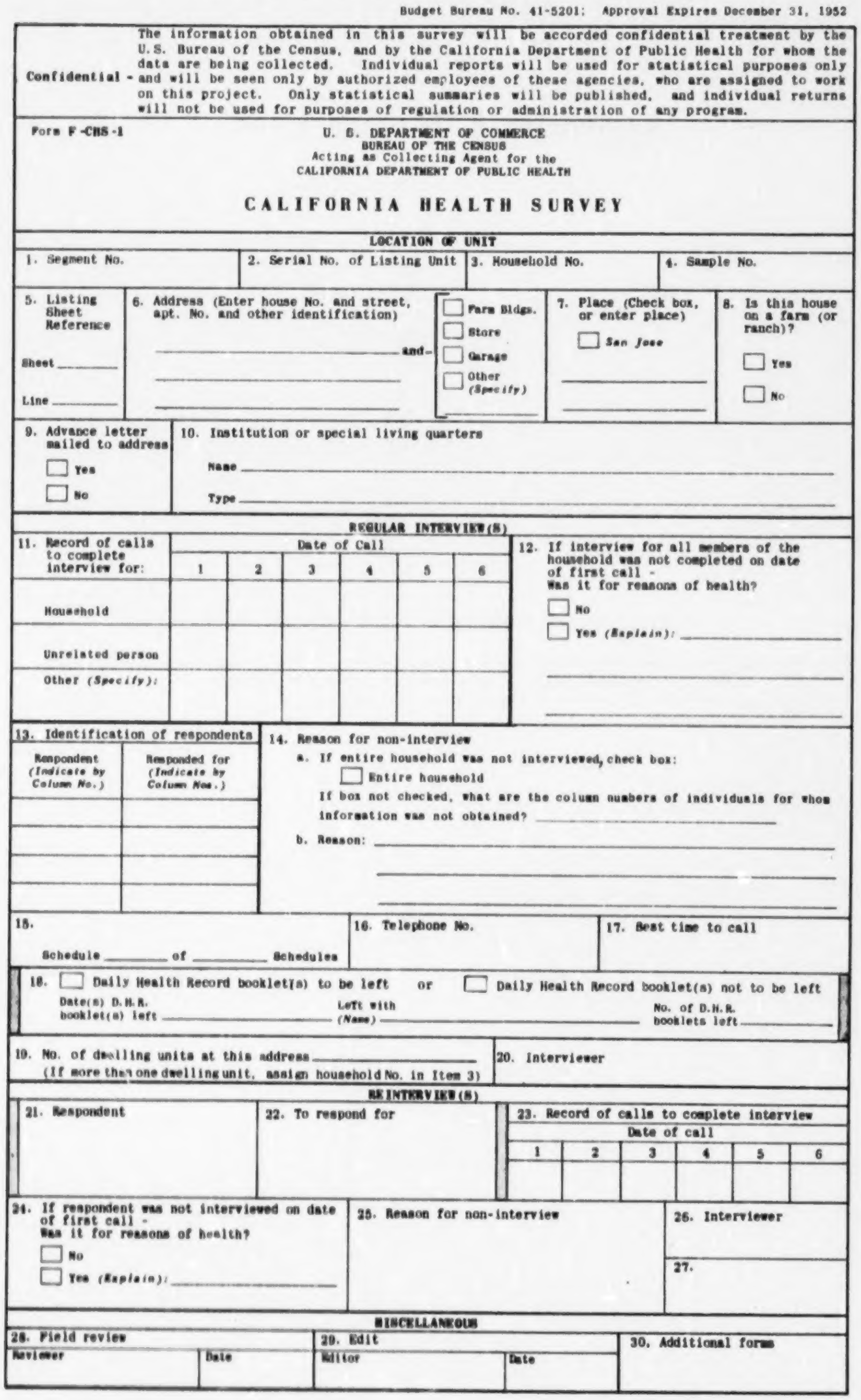


Figure E-1. Initial questionnaire: San Jose Survey

Budget Bureau No. 41-5201: Approval Expires December 31, 1952

Confidential - The information obtained in this survey will be accorded confidential treatment by the U.S. Bureau of the Census, and by the California Department of Public Health for whom the data are being collected. Individual reports will be used for statistical purposes only and will be seen only by authorized employees of these agencies, who are assigned to work on this project. Only statistical summaries will be published, and individual returns will not be used for purposes of regulation or administration of any program.

Form F-CHS-1

U. S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
Acting as Collecting Agent for the
CALIFORNIA DEPARTMENT OF PUBLIC HEALTH

CALIFORNIA HEALTH SURVEY

LOCATION OF UNIT

1. Segment No.	2. Serial No. of Listing Unit	3. Household No.	4. Sample No.

5. Listing Sheet Reference
Sheet ______
Line ______

6. Address (Enter house No. and street, apt. No. and other identification)
______________________ and-
☐ Farm Bldgs.
☐ Store
☐ Garage
☐ Other *(Specify)* ______
____
____

7. Place (Check box, or enter place)
☐ *San Jose*
____
____

8. Is this house on a farm (or ranch)?
☐ Yes
☐ No

9. Advance letter mailed to address
☐ Yes
☐ No

10. Institution or special living quarters
Name ______________________
Type ______________________

REGULAR INTERVIEW(S)

11. Record of calls to complete interview for:	Date of Call					
	1	2	3	4	5	6
Household						
Unrelated person						
Other *(Specify)*:						

12. If interview for all members of the household was not completed on date of first call -
Was it for reasons of health?
☐ No
☐ Yes *(Explain)*: ______________________
____
____

13. Identification of respondents

Respondent *(Indicate by Column No.)*	Responded for *(Indicate by Column Nos.)*

14. Reason for non-interview
a. If entire household was not interviewed, check box:
☐ Entire household
If box not checked, what are the column numbers of individuals for whom information was not obtained? ______________________
b. Reason: ______________________
____
____

15. Schedule ______ of ______ Schedules

16. Telephone No.

17. Best time to call

18. ☐ Daily Health Record booklet(s) to be left or ☐ Daily Health Record booklet(s) not to be left
Date(s) D.H.R. booklet(s) left ______________ Left with *(Name)* ______________ No. of D.H.R. booklets left ______

19. No. of dwelling units at this address ______________
(If more than one dwelling unit, assign household No. in Item 3)

20. Interviewer

REINTERVIEW(S)

21. Respondent

22. To respond for

23. Record of calls to complete interview					
Date of call					
1	2	3	4	5	6

24. If respondent was not interviewed on date of first call -
Was it for reasons of health?
☐ No
☐ Yes *(Explain)*: ______________________

25. Reason for non-interview

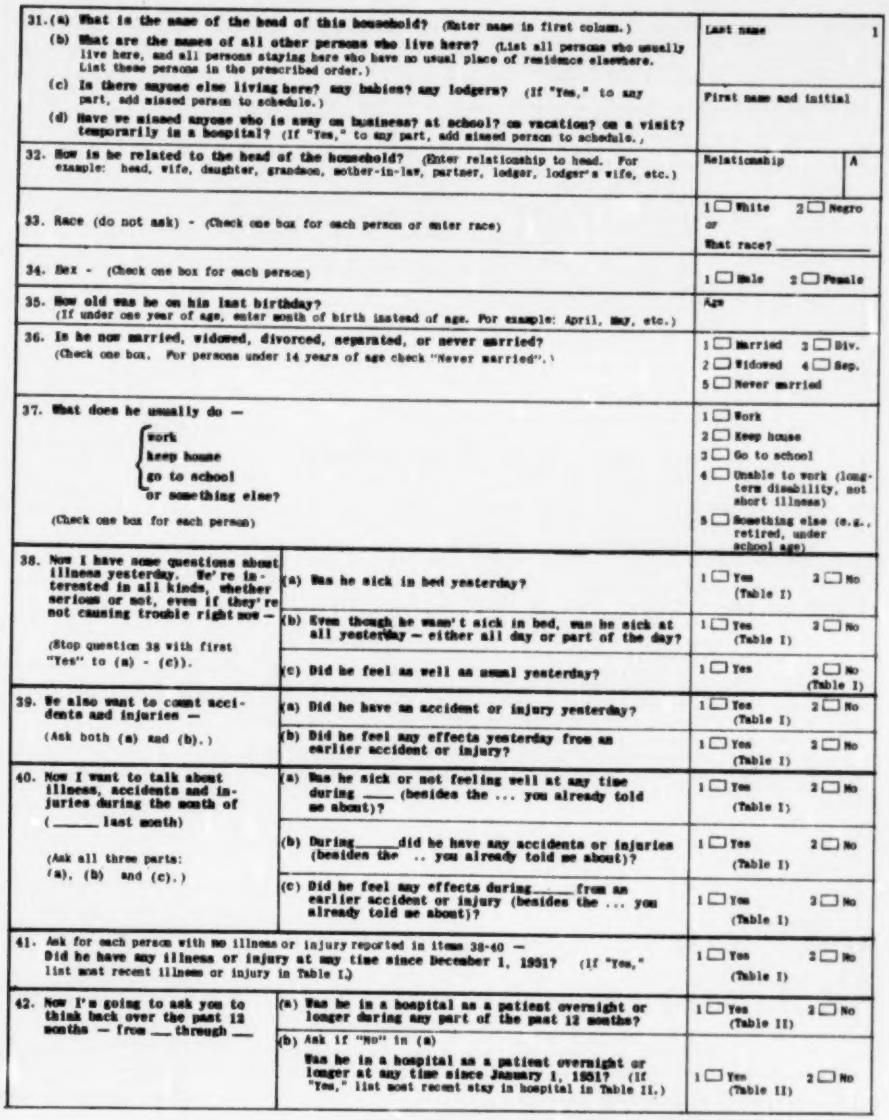
26. Interviewer

27.

MISCELLANEOUS

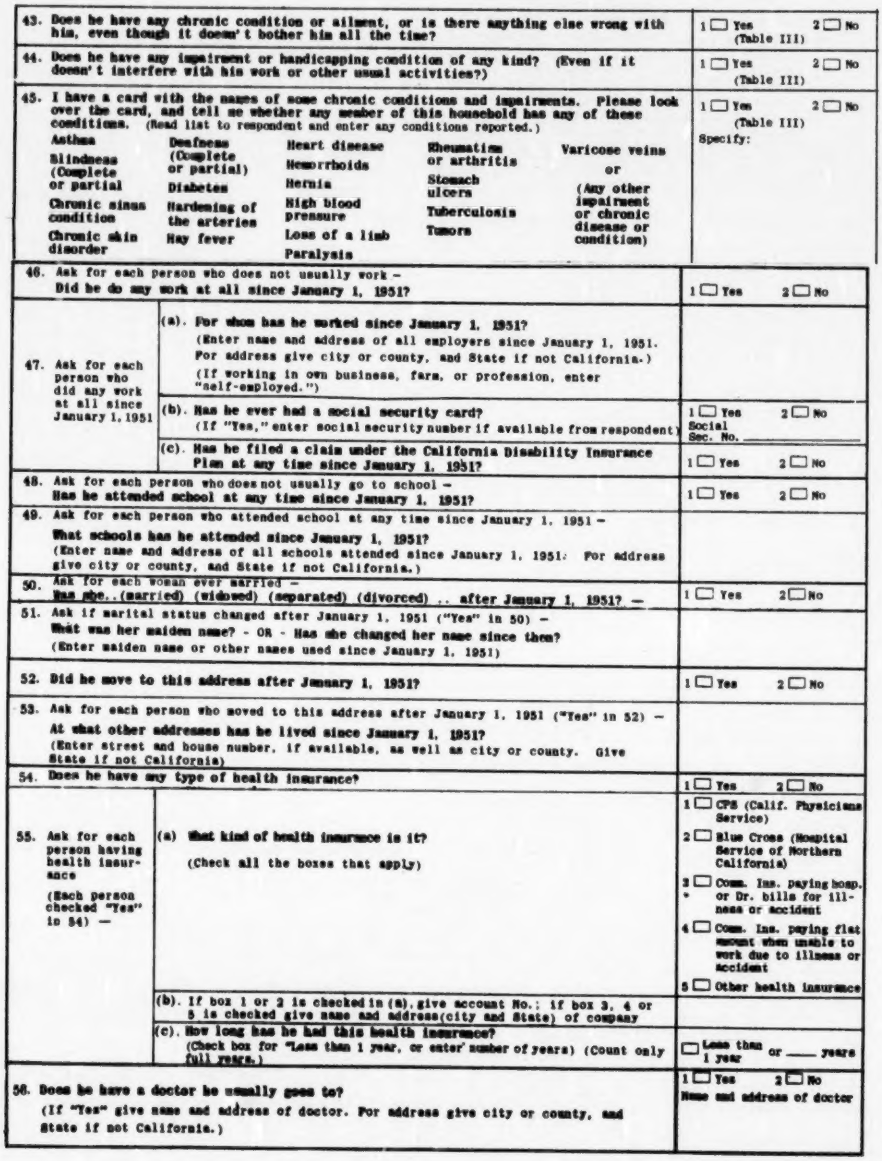
28. Field review		29. Edit		30. Additional forms
Reviewer	Date	Editor	Date	

Figure E-1. Initial questionnaire: San Jose Survey—Continued



31.(a) **What is the name of the head of this household?** (Enter name in first column.) (b) **What are the names of all other persons who live here?** (List all persons who usually live here, and all persons staying here who have no usual place of residence elsewhere. List these persons in the prescribed order.) (c) **Is there anyone else living here? any babies? any lodgers?** (If "Yes," to any part, add missed person to schedule.) (d) **Have we missed anyone who is away on business? at school? on vacation? on a visit? temporarily in a hospital?** (If "Yes," to any part, add missed person to schedule.,		Last name 1 First name and initial
32. **How is he related to the head of the household?** (Enter relationship to head. For example: head, wife, daughter, grandson, mother-in-law, partner, lodger, lodger's wife, etc.)		Relationship A
33. Race (do not ask) - (Check one box for each person or enter race)		1 ☐ White 2 ☐ Negro or What race? ______
34. Sex - (Check one box for each person)		1 ☐ Male 2 ☐ Female
35. **How old was he on his last birthday?** (If under one year of age, enter month of birth instead of age. For example: April, May, etc.)		Age
36. **Is he now married, widowed, divorced, separated, or never married?** (Check one box. For persons under 14 years of age check "Never married".)		1 ☐ Married 3 ☐ Div. 2 ☐ Widowed 4 ☐ Sep. 5 ☐ Never married
37. **What does he usually do — work keep house go to school or something else?** (Check one box for each person)		1 ☐ Work 2 ☐ Keep house 3 ☐ Go to school 4 ☐ Unable to work (long-term disability, not short illness) 5 ☐ Something else (e.g., retired, under school age)
38. **Now I have some questions about illness yesterday. We're interested in all kinds, whether serious or not, even if they're not causing trouble right now —** (Stop question 38 with first "Yes" to (a) - (c)).	(a) **Was he sick in bed yesterday?**	1 ☐ Yes (Table I) 2 ☐ No
	(b) **Even though he wasn't sick in bed, was he sick at all yesterday — either all day or part of the day?**	1 ☐ Yes (Table I) 2 ☐ No
	(c) **Did he feel as well as usual yesterday?**	1 ☐ Yes 2 ☐ No (Table I)
39. **We also want to count accidents and injuries —** (Ask both (a) and (b).)	(a) **Did he have an accident or injury yesterday?**	1 ☐ Yes (Table I) 2 ☐ No
	(b) **Did he feel any effects yesterday from an earlier accident or injury?**	1 ☐ Yes (Table I) 2 ☐ No
40. **Now I want to talk about illness, accidents and injuries during the month of (______ last month)** (Ask all three parts: (a), (b) and (c).)	(a) **Was he sick or not feeling well at any time during ____ (besides the ... you already told me about)?**	1 ☐ Yes (Table I) 2 ☐ No
	(b) **During______did he have any accidents or injuries (besides the .. you already told me about)?**	1 ☐ Yes (Table I) 2 ☐ No
	(c) **Did he feel any effects during_____from an earlier accident or injury (besides the ... you already told me about)?**	1 ☐ Yes (Table I) 2 ☐ No
41. Ask for each person with no illness or injury reported in items 38-40 — **Did he have any illness or injury at any time since December 1, 1951?** (If "Yes," list most recent illness or injury in Table I.)		1 ☐ Yes (Table I) 2 ☐ No
42. **Now I'm going to ask you to think back over the past 12 months — from ___ through ___**	(a) **Was he in a hospital as a patient overnight or longer during any part of the past 12 months?**	1 ☐ Yes (Table II) 2 ☐ No
	(b) Ask if "No" in (a) **Was he in a hospital as a patient overnight or longer at any time since January 1, 1951?** (If "Yes," list most recent stay in hospital in Table II.)	1 ☐ Yes (Table II) 2 ☐ No

Figure E-1. Initial questionnaire: San Jose Survey—Continued



43.	**Does he have any chronic condition or ailment, or is there anything else wrong with him, even though it doesn't bother him all the time?**	1 ☐ Yes (Table III) 2 ☐ No
44.	**Does he have any impairment or handicapping condition of any kind? (Even if it doesn't interfere with his work or other usual activities?)**	1 ☐ Yes (Table III) 2 ☐ No
45.	**I have a card with the names of some chronic conditions and impairments. Please look over the card, and tell me whether any member of this household has any of these conditions.** (Read list to respondent and enter any conditions reported.) **Asthma** **Blindness (Complete or partial** **Chronic sinus condition** **Chronic skin disorder** **Deafness (Complete or partial)** **Diabetes** **Hardening of the arteries** **Hay fever** **Heart disease** **Hemorrhoids** **Hernia** **High blood pressure** **Loss of a limb** **Paralysis** **Rheumatism or arthritis** **Stomach ulcers** **Tuberculosis** **Tumors** **Varicose veins** **or** **(Any other impairment or chronic disease or condition)**	1 ☐ Yes (Table III) 2 ☐ No Specify:
46.	Ask for each person who does not usually work – **Did he do any work at all since January 1, 1951?**	1 ☐ Yes 2 ☐ No
47. Ask for each person who did any work at all since January 1, 1951	(a). **For whom has he worked since January 1, 1951?** (Enter name and address of all employers since January 1, 1951. For address give city or county, and State if not California.) (If working in own business, farm, or profession, enter "self-employed.")	
	(b). **Has he ever had a social security card?** (If "Yes," enter social security number if available from respondent)	1 ☐ Yes 2 ☐ No Social Sec. No. ______
	(c). **Has he filed a claim under the California Disability Insurance Plan at any time since January 1, 1951?**	1 ☐ Yes 2 ☐ No
48.	Ask for each person who does not usually go to school – **Has he attended school at any time since January 1, 1951?**	1 ☐ Yes 2 ☐ No
49.	Ask for each person who attended school at any time since January 1, 1951 – **What schools has he attended since January 1, 1951?** (Enter name and address of all schools attended since January 1, 1951. For address give city or county, and State if not California.)	
50.	Ask for each woman ever married – **Was she..(married) (widowed) (separated) (divorced) .. after January 1, 1951? –**	1 ☐ Yes 2 ☐ No
51.	Ask if marital status changed after January 1, 1951 ("Yes" in 50) – **What was her maiden name?** - OR - **Has she changed her name since then?** (Enter maiden name or other names used since January 1, 1951)	
52.	**Did he move to this address after January 1, 1951?**	1 ☐ Yes 2 ☐ No
53.	Ask for each person who moved to this address after January 1, 1951 ("Yes" in 52) – **At what other addresses has he lived since January 1, 1951?** (Enter street and house number, if available, as well as city or county. Give State if not California)	
54.	**Does he have any type of health insurance?**	1 ☐ Yes 2 ☐ No
55. Ask for each person having health insurance (Each person checked "Yes" in 54) –	(a) **What kind of health insurance is it?** (Check all the boxes that apply)	1 ☐ CPS (Calif. Physicians Service) 2 ☐ Blue Cross (Hospital Service of Northern California) 3 ☐ Comm. Ins. paying hosp. or Dr. bills for illness or accident 4 ☐ Comm. Ins. paying flat amount when unable to work due to illness or accident 5 ☐ Other health insurance
	(b). If box 1 or 2 is checked in (a), give account No.; if box 3, 4 or 5 is checked give name and address (city and State) of company	
	(c). **How long has he had this health insurance?** (Check box for "Less than 1 year, or enter number of years) (Count only full years.)	☐ Less than 1 year or ____ years
56.	**Does he have a doctor he usually goes to?** (If "Yes" give name and address of doctor. For address give city or county, and State if not California.)	1 ☐ Yes 2 ☐ No Name and address of doctor

Figure E-1. Initial questionnaire: San Jose Survey—Continued

TABLE I - ILLNESSES AND INJURIES

						IF A DOCTOR WAS SEEN ABOUT ...:		
Col-No. of per-son	Item No.	What seemed to be the matter? - or - In what way did he not feel as well as usual? - or - What happened? (Enter respondent's own words)	Code B	When did ... start? - or - When did ... hap-pen? (Enter date as exactly as possi-ble, e.g., Jan. 14, 1952)	Was a doctor seen about...? (Enter "No," or date doctor was seen)	What is the doctor's name and address? (Enter full name and city or county. Give State if not California.)	What did the doctor say it was — did he use any medical terms?	Code C
(a)	(b)	(c)		(d)	(e)	(f)	(g)	

ASK FOR EACH ILLNESS OR INJURY LAST MONTH							ASK FOR EACH ILLNESS OR INJURY YESTERDAY					
During ... was he confined to bed on any days because of ... either all or part of the day (Enter "Yes," or "No")	If "Yes" in (h)		During ... was he con-fined to the house but not to bed because of ... either all or part of the day? (Enter "None" or number of days)	Code D	Were there any (other) days during ... when he was unable to carry on his work or other usual activities because of ... ? (Enter "None" or number of days)	Code E	Was he able to carry on his work or other usual activities yesterday? (Enter "Yes," or "No")	If "No" in (m) (Check one column only)				Code F
	How many nights in a hos-pital?	How many days at home?						Was he in a hos-pital as a pa-tient?	Was he in bed, but not in a hos-pi-tal?	Was he con-fined to house but not in bed?	Was he not con-fined to house?	
(h)	(i)	(j)	(k)		(l)		(m)	(n)	(o)	(p)	(q)	

Figure E-1. Initial questionnaire: San Jose Survey—Continued

TABLE II - HOSPITALIZATION							
Col No. of per son	Item No.	When did he enter the hos-pital? (Month and year)	How many nights was he in the hospital?	What was the reason that he went to the hospital?	Were any operations performed on him during this stay in the hospital? (Enter "None," or name(s) of operation(s))	Code 6	What was the name and address of the hospital he was in? (Enter the name, and the city or county. Give State if not California)
(a)	(b)	(c)	(d)	(e)	(f)		(g)

TABLE III - CHRONIC DISEASES, IMPAIRMENTS & HANDICAPPING CONDITIONS						
Col. No. of per-son	Item No.	Has he ever seen a doc-tor about it? (Enter "No," or year doctor was first seen)	Description of condition (If doctor said what it was, enter doctor's description; otherwise enter respondent's description)	Code 8	When did he first notice this condition? (Enter year)	Did this condition cause any (other) illness dur-ing ___? (If "Yes," fill Table I)
(a)	(b)	(c)	(d)		(e)	(f)

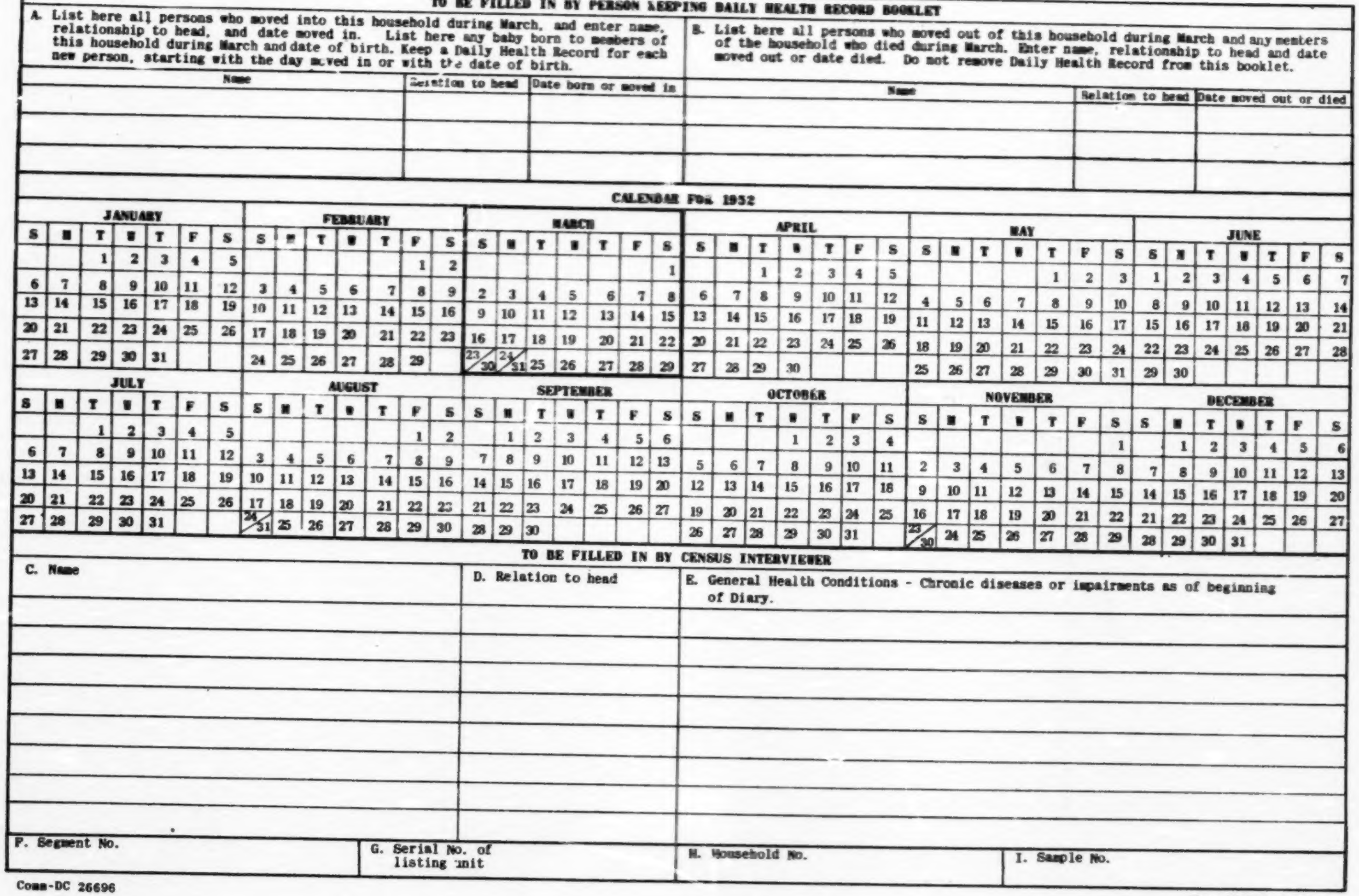
FOOTNOTES AND FIELD COMMENTS

(Be sure to enter item number for each footnote)

Figure E-2. Initial diary: San Jose Survey

The following pages are for group I initial diaries kept during March 1952. The initial diaries for groups III–V were similar.

Figure E-2. Initial diary: San Jose Survey



TO BE FILLED IN BY PERSON KEEPING DAILY HEALTH RECORD BOOKLET

A. List here all persons who moved into this household during March, and enter name, relationship to head, and date moved in. List here any baby born to members of this household during March and date of birth. Keep a Daily Health Record for each new person, starting with the day moved in or with the date of birth.

Name	Relation to head	Date born or moved in

B. List here all persons who moved out of this household during March and any members of the household who died during March. Enter name, relationship to head and date moved out or date died. Do not remove Daily Health Record from this booklet.

Name	Relation to head	Date moved out or died

CALENDAR FOR 1952

JANUARY

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

FEBRUARY

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	

MARCH

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23/30	24/31	25	26	27	28	29

APRIL

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

MAY

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

JUNE

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

JULY

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

AUGUST

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24/31	25	26	27	28	29	30

SEPTEMBER

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

OCTOBER

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

NOVEMBER

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23/30	24	25	26	27	28	29

DECEMBER

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

TO BE FILLED IN BY CENSUS INTERVIEWER

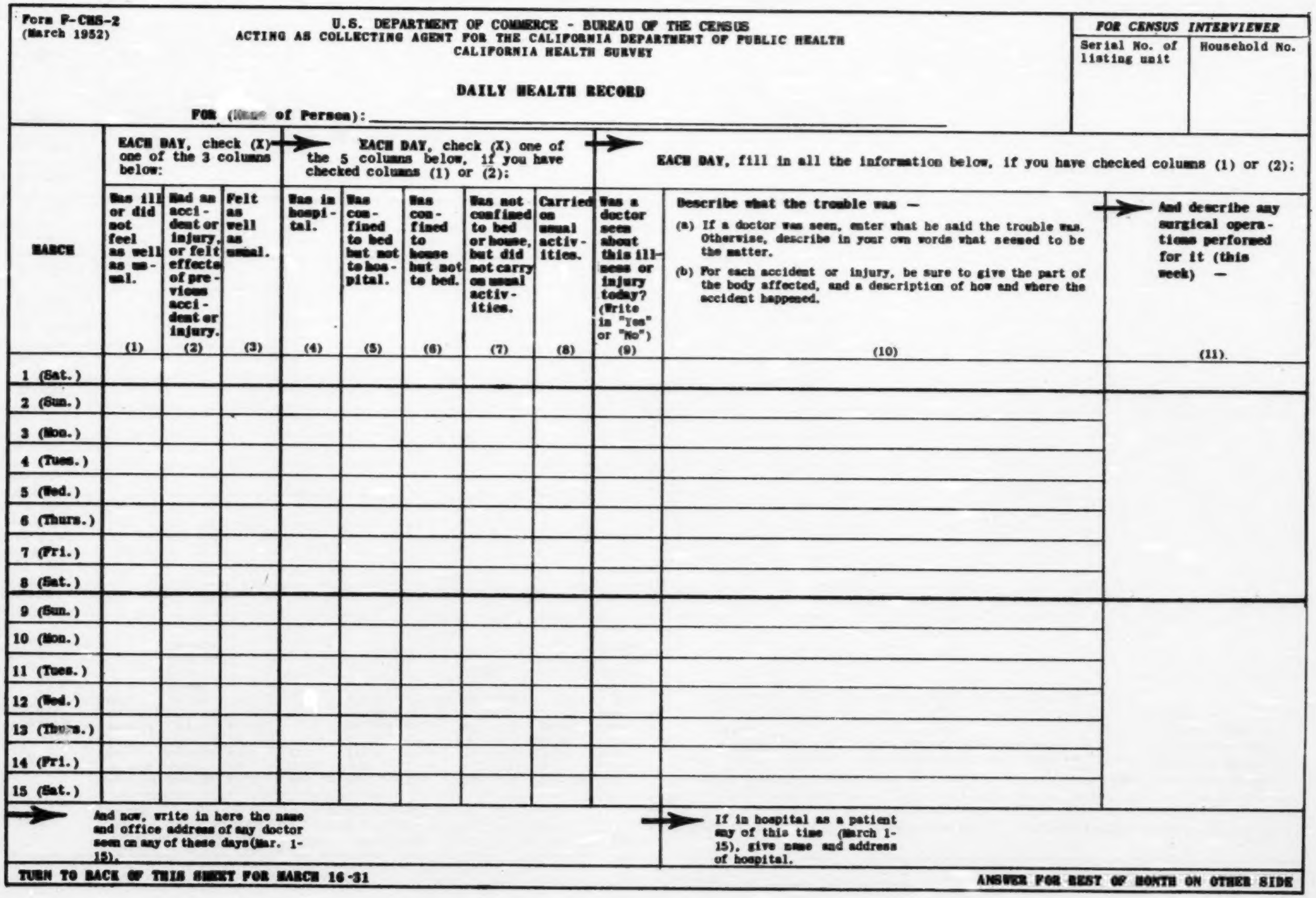
C. Name	D. Relation to head	E. General Health Conditions - Chronic diseases or impairments as of beginning of Diary.

F. Segment No.	G. Serial No. of listing unit	H. Household No.	I. Sample No.

Comm-DC 26696

Form F-CHS-2 (3-52)

Figure E-2. Initial diary: San Jose Survey—Continued



Form P-CHS-2
(March 1952)

U.S. DEPARTMENT OF COMMERCE - BUREAU OF THE CENSUS
ACTING AS COLLECTING AGENT FOR THE CALIFORNIA DEPARTMENT OF PUBLIC HEALTH
CALIFORNIA HEALTH SURVEY

FOR CENSUS INTERVIEWER

Serial No. of listing unit:

Household No.:

DAILY HEALTH RECORD

FOR (Name of Person): ____________________

MARCH	EACH DAY, check (X) one of the 3 columns below: →			EACH DAY, check (X) one of the 5 columns below, if you have checked columns (1) or (2): →					EACH DAY, fill in all the information below, if you have checked columns (1) or (2):		
	Was ill or did not feel as well as usual. (1)	Had an accident or injury, or felt effects of previous accident or injury. (2)	Felt as well as usual. (3)	Was in hospital. (4)	Was confined to bed but not to hospital. (5)	Was confined to house but not to bed. (6)	Was not confined to bed or house, but did not carry on usual activities. (7)	Carried on usual activities. (8)	Was a doctor seen about this illness or injury today? (Write in "Yes" or "No") (9)	Describe what the trouble was — (a) If a doctor was seen, enter what he said the trouble was. Otherwise, describe in your own words what seemed to be the matter. (b) For each accident or injury, be sure to give the part of the body affected, and a description of how and where the accident happened. (10)	→ And describe any surgical operations performed for it (this week) — (11).
1 (Sat.)											
2 (Sun.)											
3 (Mon.)											
4 (Tues.)											
5 (Wed.)											
6 (Thurs.)											
7 (Fri.)											
8 (Sat.)											
9 (Sun.)											
10 (Mon.)											
11 (Tues.)											
12 (Wed.)											
13 (Thurs.)											
14 (Fri.)											
15 (Sat.)											

→ And now, write in here the name and office address of any doctor seen on any of these days (Mar. 1-15).

→ If in hospital as a patient any of this time (March 1-15), give name and address of hospital.

TURN TO BACK OF THIS SHEET FOR MARCH 16-31

ANSWER FOR REST OF MONTH ON OTHER SIDE

Figure E-2. Initial diary: San Jose Survey—Continued

MARCH	EACH DAY, check (X) one of the 3 columns below:			EACH DAY, check (X) one of the 5 columns below, if you have checked columns (1) or (2):					EACH DAY, fill in all the information below, if you have checked columns (1) or (2).		
	Was ill or did not feel as well as usual. (1)	Had an accident or injury, or felt effects or previous accident or injury. (2)	Felt as well as usual. (3)	Was in hospital. (4)	Was confined to bed but not to hospital. (5)	Was confined to house but not to bed. (6)	Was not confined to bed or house, but did not carry on usual activities. (7)	Carried on usual activities. (8)	Was a doctor seen about this illness or injury today? (Write in "Yes" or "No") (9)	Describe what the trouble was — (a) If a doctor was seen, enter what he said the trouble was. Otherwise, describe in your own words what seemed to be the matter. (b) For each accident or injury, be sure to give the part of the body affected, and a description of how and where the accident happened. (10)	And describe any surgical operations performed for it (this week) — (11)
16 (Sun.)											
17 (Mon.)											
18 (Tues.)											
19 (Wed.)											
20 (Thurs.)											
21 (Fri.)											
22 (Sat.)											
23 (Sun.)											
24 (Mon.)											
25 (Tues.)											
26 (Wed.)											
27 (Thurs.)											
28 (Fri.)											
29 (Sat.)											
30 (Sun.)											
31 (Mon.)											

→ And now, write in here the name and office address of any doctor seen on any of these days (March 16 - 31).

→ If in hospital as a patient any of this time (March 16-31), give name and address of hospital.

→ Use this space to write in any notes you didn't have room for anywhere else on this sheet —

→ Name of person who filled in this sheet

PLEASE GO BACK OVER BOTH SIDES OF THIS SHEET AND MAKE SURE YOU HAVE GIVEN ALL THE INFORMATION ASKED FOR

Comm-DC 26696

Form F-CHS-2 (3-52)

Figure E-2. Initial diary: San Jose Survey—Continued

REMINDERS FOR FILLING THE DAILY HEALTH RECORD BOOKLET

General Reminders - There is a separate sheet for each person, with his or her name written in at the top. Make the entries for each person each day, on the line for that day.

Keep a day-by-day health record for each new person who moves into this household, and any infant born to a member of the household, starting with the date of moving in or date of birth. Use the extra sheets for this purpose.

Do not remove from the Daily Health Record Booklet the sheet for any person who moves away or dies during the month. Do not continue the daily entries for such persons from the date of moving away or date of death.

The person who makes the daily entries is to sign his name in the space provided in the lower right-hand corner on the back of the sheet.

Columns (1), (2), and (3) - Place a check each day in one of columns (1), (2), or (3) on each person's sheet regardless of whether or not the person is sick or injured, and regardless of whether or not he is away from home temporarily.

Columns (4), (5), (6), (7), and (8) - Every time a check is made in column (1) or column (2), place a check in one of columns (4), (5), (6), (7), or (8) to show how the person's "usual activities" were affected.

"Usual activities" are the things the person ordinarily does each day. For example: work, for a person who has a job or business; going to school, for children in school; regular housework and care of home (and children) for housewives. For a Sunday, "usual activities" means the things the person ordinarily does on Sunday — for example: go to church, visit family or friends, spend the day at home listening to the radio, or the like. For a child not in school, "usual activities" means whatever the regular pattern is for the child's day — it may or may not include play indoors or out of doors for part of the day, depending upon the age of the child. For persons not working, not in school, and not responsible for the home, "usual activities" refers to the way in which they usually spend their time. For retired or elderly persons, the normal day might consist of almost no activity but cutting down of even that small amount would mean that the person had "not carried on usual activities."

Columns (9), (10), and (11) - Every time a check is made in column (1) or column (2), fill in all the information asked for in columns (9), (10), and (11).

If a doctor was seen about the illness or injury, write "Yes" in column (9), otherwise write "No." Do not count telephone calls to a doctor as "seeing" him. If a doctor was seen about the illness or injury, enter his name and office address at the bottom of the sheet.

If a doctor was seen, enter in column (10) what he said the trouble was, otherwise write in your own description of the illness or injury.

In describing an illness give the name of the illness and not just the symptoms, since the same symptoms may occur with different illnesses. An entry such as "cough" by itself is not enough, and the cause should be given. For example: "cough due to cold," "cough due to whooping cough," "cough - cause not known," etc. However, if you know the name of the illness, the name by itself is enough; "cold" or "whooping cough" are satisfactory entries.

In describing an accident or injury, report which part of the body is affected, and how and where the accident happened. An example of a complete description is: "left leg broken due to fall on sidewalk in front of home."

For each chronic condition or ailment, be sure to record any attacks or other trouble which the person has during the month.

In column (11), describe any operations performed during the month. Be sure to give the name of the condition for which the operation was performed, and the part of the body affected. For example, say "removal of cyst from left leg" and not just "operation on left leg." Count as surgical operations any puncturing or cutting of the skin, including stitching of cuts or wounds. Do not count injections.

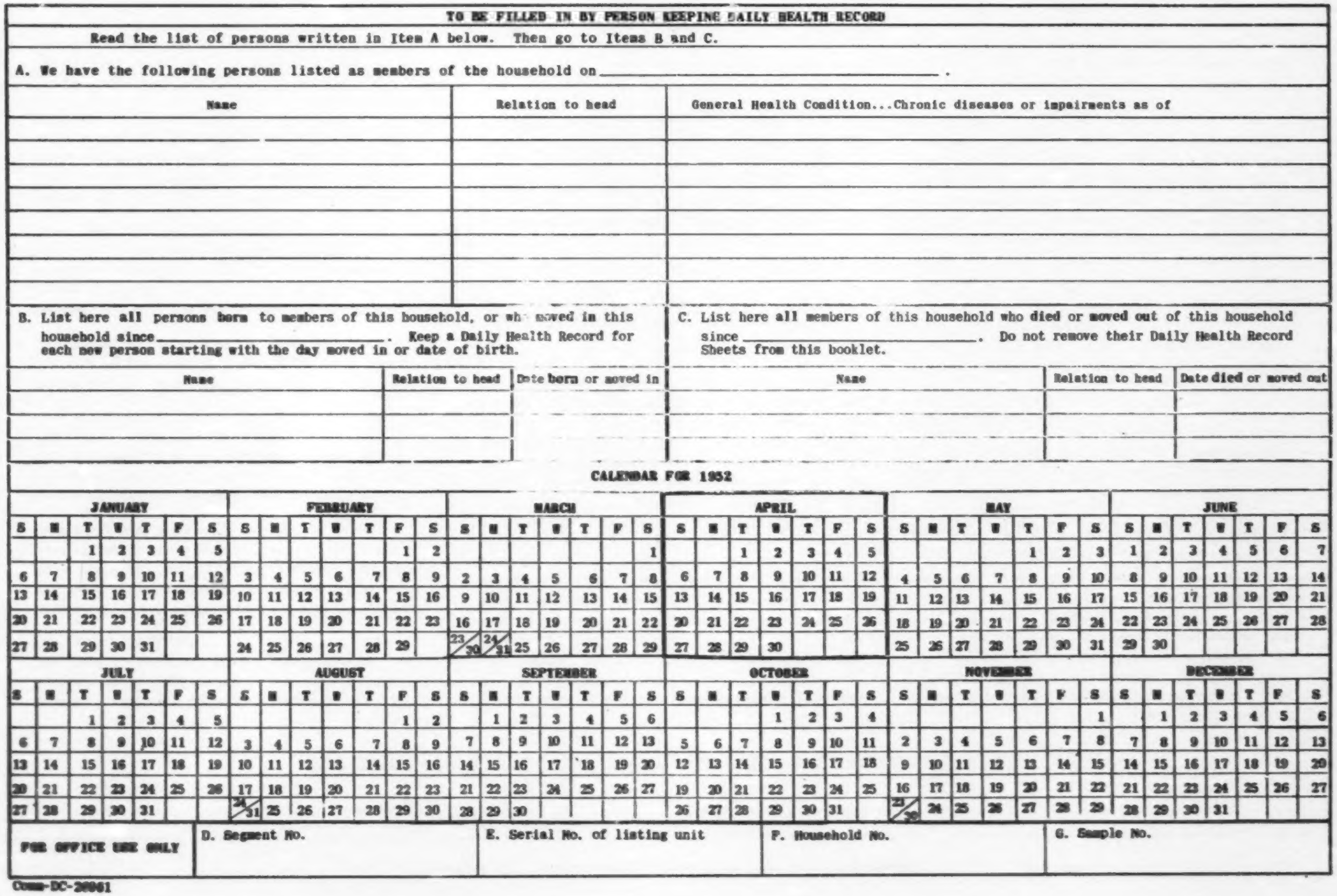
If the person was in a hospital as a patient over night or longer, enter the name and address of the hospital at the bottom of the sheet.

Comm-DC-27784

Form P-CHS-2 (4-52)

Figure E-3. Initial page from repeat diary: San Jose Survey

Other pages in the repeat diary were identical to those for the initial diary (fig. E-2).



TO BE FILLED IN BY PERSON KEEPING DAILY HEALTH RECORD

Read the list of persons written in Item A below. Then go to Items B and C.

A. We have the following persons listed as members of the household on ______________________ .

Name	Relation to head	General Health Condition...Chronic diseases or impairments as of

B. List here all persons born to members of this household, or who moved in this household since ______________. Keep a Daily Health Record for each new person starting with the day moved in or date of birth.

Name	Relation to head	Date born or moved in

C. List here all members of this household who died or moved out of this household since ______________. Do not remove their Daily Health Record Sheets from this booklet.

Name	Relation to head	Date died or moved out

CALENDAR FOR 1952

JANUARY

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

FEBRUARY

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	

MARCH

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23/30	24/31	25	26	27	28	29

APRIL

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

MAY

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

JUNE

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

JULY

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

AUGUST

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24/31	25	26	27	28	29	30

SEPTEMBER

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

OCTOBER

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

NOVEMBER

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23/30	24	25	26	27	28	29

DECEMBER

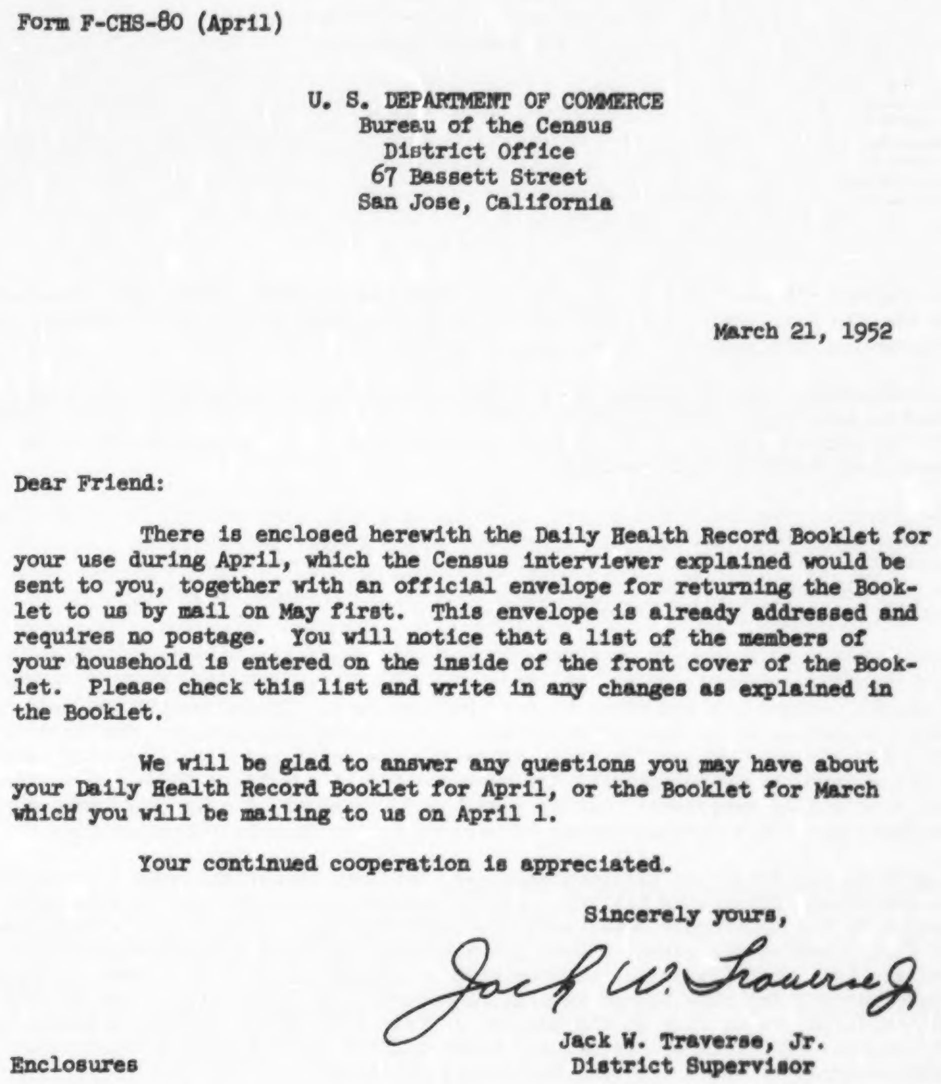
S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

FOR OFFICE USE ONLY	D. Segment No.	E. Serial No. of listing unit	F. Household No.	G. Sample No.

Comm-DC-20061

Figure E-4. Letter to keeper of first repeat diary: San Jose Survey

The letter shown below was sent to the first repeat diary group of group I. Similar letters were used for the second and third repeat diaries of group I and for the first repeat diaries of groups III-V.



Form F-CHS-80 (April)

U. S. DEPARTMENT OF COMMERCE
Bureau of the Census
District Office
67 Bassett Street
San Jose, California

March 21, 1952

Dear Friend:

There is enclosed herewith the Daily Health Record Booklet for your use during April, which the Census interviewer explained would be sent to you, together with an official envelope for returning the Booklet to us by mail on May first. This envelope is already addressed and requires no postage. You will notice that a list of the members of your household is entered on the inside of the front cover of the Booklet. Please check this list and write in any changes as explained in the Booklet.

We will be glad to answer any questions you may have about your Daily Health Record Booklet for April, or the Booklet for March which you will be mailing to us on April 1.

Your continued cooperation is appreciated.

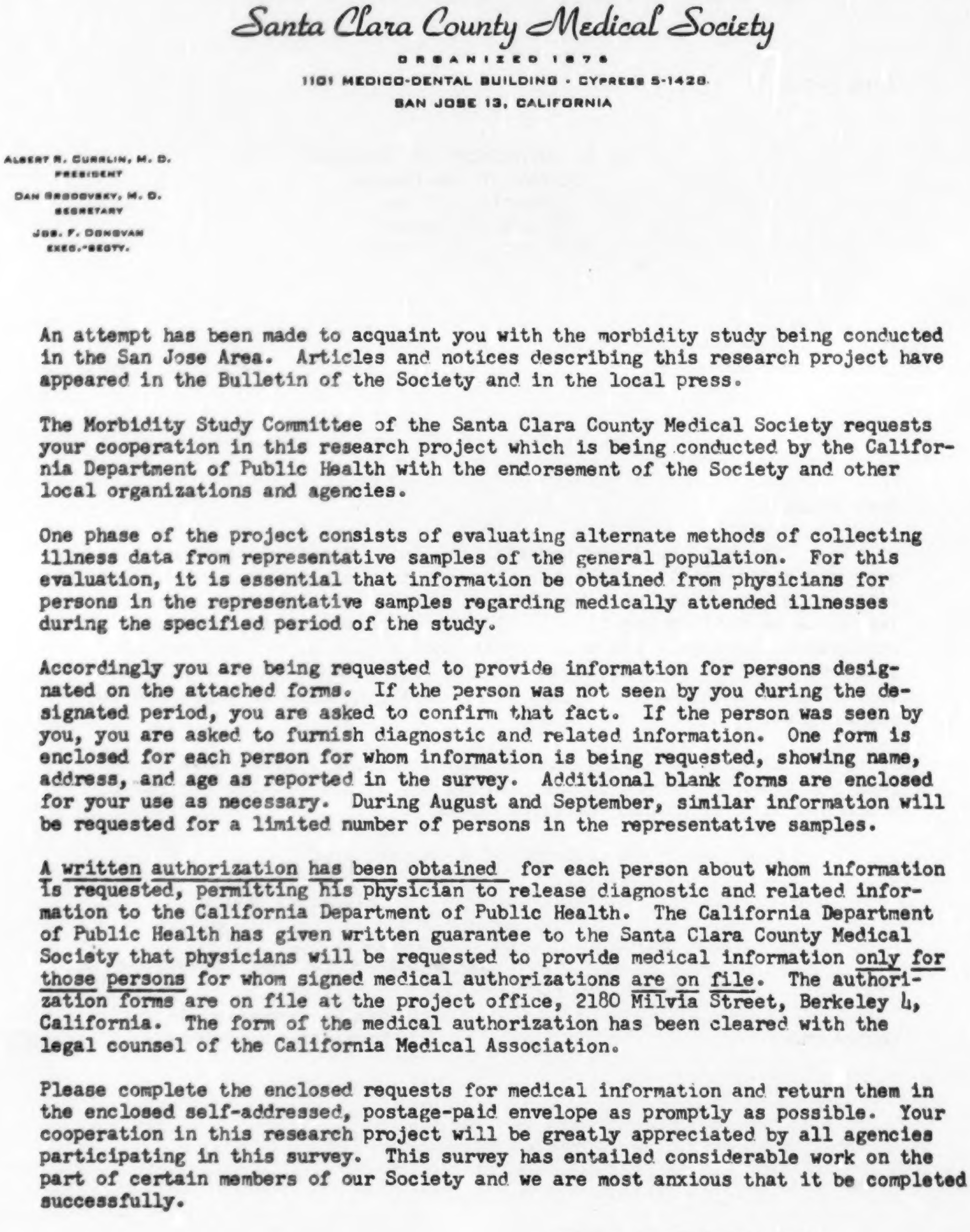
Sincerely yours,

Jack W. Traverse Jr.

Jack W. Traverse, Jr.
District Supervisor

Enclosures

Figure E-5. Letter to physician: San Jose Survey



Santa Clara County Medical Society
ORGANIZED 1876
1101 MEDICO-DENTAL BUILDING · CYPRESS 5-1428
SAN JOSE 13, CALIFORNIA

ALBERT R. CURRLIN, M. D.
PRESIDENT
DAN BRODOVSKY, M. D.
SECRETARY
JOS. F. DONOVAN
EXEC.-SECTY.

An attempt has been made to acquaint you with the morbidity study being conducted in the San Jose Area. Articles and notices describing this research project have appeared in the Bulletin of the Society and in the local press.

The Morbidity Study Committee of the Santa Clara County Medical Society requests your cooperation in this research project which is being conducted by the California Department of Public Health with the endorsement of the Society and other local organizations and agencies.

One phase of the project consists of evaluating alternate methods of collecting illness data from representative samples of the general population. For this evaluation, it is essential that information be obtained from physicians for persons in the representative samples regarding medically attended illnesses during the specified period of the study.

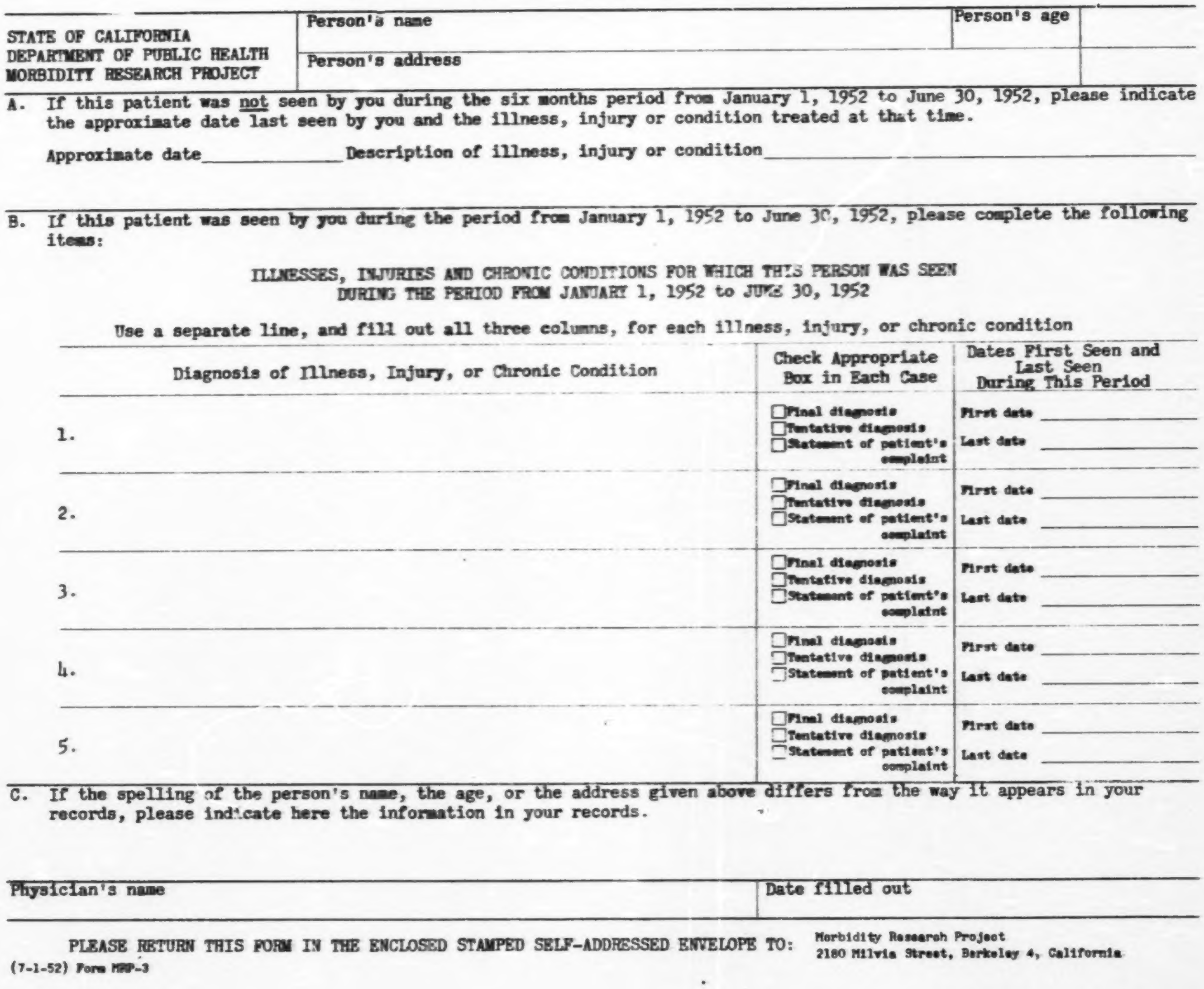
Accordingly you are being requested to provide information for persons designated on the attached forms. If the person was not seen by you during the designated period, you are asked to confirm that fact. If the person was seen by you, you are asked to furnish diagnostic and related information. One form is enclosed for each person for whom information is being requested, showing name, address, and age as reported in the survey. Additional blank forms are enclosed for your use as necessary. During August and September, similar information will be requested for a limited number of persons in the representative samples.

A written authorization has been obtained for each person about whom information is requested, permitting his physician to release diagnostic and related information to the California Department of Public Health. The California Department of Public Health has given written guarantee to the Santa Clara County Medical Society that physicians will be requested to provide medical information only for those persons for whom signed medical authorizations are on file. The authorization forms are on file at the project office, 2180 Milvia Street, Berkeley 4, California. The form of the medical authorization has been cleared with the legal counsel of the California Medical Association.

Please complete the enclosed requests for medical information and return them in the enclosed self-addressed, postage-paid envelope as promptly as possible. Your cooperation in this research project will be greatly appreciated by all agencies participating in this survey. This survey has entailed considerable work on the part of certain members of our Society and we are most anxious that it be completed successfully.

Roger J. Burkhart, M.D.
Chairman, Morbidity Study Committee

Figure E-6. Physician reporting form: San Jose Survey



STATE OF CALIFORNIA DEPARTMENT OF PUBLIC HEALTH MORBIDITY RESEARCH PROJECT	Person's name	Person's age	
	Person's address		

A. If this patient was not seen by you during the six months period from January 1, 1952 to June 30, 1952, please indicate the approximate date last seen by you and the illness, injury or condition treated at that time.

Approximate date__________ Description of illness, injury or condition__________

B. If this patient was seen by you during the period from January 1, 1952 to June 30, 1952, please complete the following items:

ILLNESSES, INJURIES AND CHRONIC CONDITIONS FOR WHICH THIS PERSON WAS SEEN
DURING THE PERIOD FROM JANUARY 1, 1952 to JUNE 30, 1952

Use a separate line, and fill out all three columns, for each illness, injury, or chronic condition

Diagnosis of Illness, Injury, or Chronic Condition	Check Appropriate Box in Each Case	Dates First Seen and Last Seen During This Period
1.	☐ Final diagnosis ☐ Tentative diagnosis ☐ Statement of patient's complaint	First date ______ Last date ______
2.	☐ Final diagnosis ☐ Tentative diagnosis ☐ Statement of patient's complaint	First date ______ Last date ______
3.	☐ Final diagnosis ☐ Tentative diagnosis ☐ Statement of patient's complaint	First date ______ Last date ______
4.	☐ Final diagnosis ☐ Tentative diagnosis ☐ Statement of patient's complaint	First date ______ Last date ______
5.	☐ Final diagnosis ☐ Tentative diagnosis ☐ Statement of patient's complaint	First date ______ Last date ______

C. If the spelling of the person's name, the age, or the address given above differs from the way it appears in your records, please indicate here the information in your records.

Physician's name	Date filled out

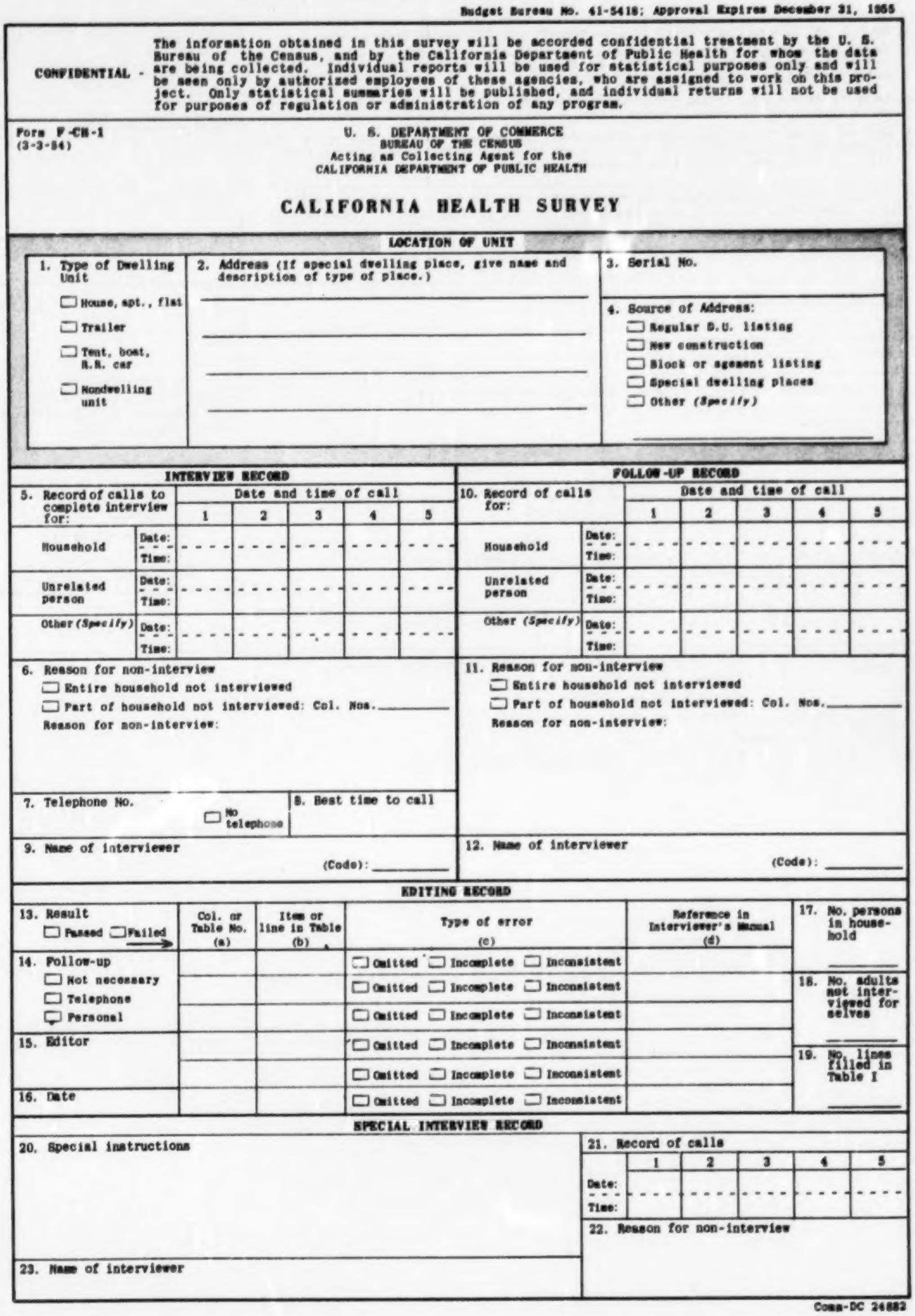
PLEASE RETURN THIS FORM IN THE ENCLOSED STAMPED SELF-ADDRESSED ENVELOPE TO: Morbidity Research Project
2180 Milvia Street, Berkeley 4, California

(7-1-52) Form MRP-3

Figure E-7. Questionnaire: California Health Survey

The following pages show the exact content and wording of the questionnaire. The actual questionnaire was designed for a household as a unit and included additional space for reports on more than one person and more than one condition.

Figure E-7. Questionnaire: California Health Survey



Budget Bureau No. 41-5418; Approval Expires December 31, 1955

CONFIDENTIAL - The information obtained in this survey will be accorded confidential treatment by the U. S. Bureau of the Census, and by the California Department of Public Health for whom the data are being collected. Individual reports will be used for statistical purposes only and will be seen only by authorized employees of these agencies, who are assigned to work on this project. Only statistical summaries will be published, and individual returns will not be used for purposes of regulation or administration of any program.

Form F-CH-1
(3-3-54)

U. S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
Acting as Collecting Agent for the
CALIFORNIA DEPARTMENT OF PUBLIC HEALTH

CALIFORNIA HEALTH SURVEY

LOCATION OF UNIT

1. Type of Dwelling Unit
   - ☐ House, apt., flat
   - ☐ Trailer
   - ☐ Tent, boat, R.R. car
   - ☐ Nondwelling unit

2. Address (If special dwelling place, give name and description of type of place.)

3. Serial No.

4. Source of Address:
   - ☐ Regular D.U. listing
   - ☐ New construction
   - ☐ Block or segment listing
   - ☐ Special dwelling places
   - ☐ Other *(Specify)*

INTERVIEW RECORD

5. Record of calls to complete interview for:		Date and time of call 1	2	3	4	5
Household	Date:					
	Time:					
Unrelated person	Date:					
	Time:					
Other *(Specify)*	Date:					
	Time:					

6. Reason for non-interview
   - ☐ Entire household not interviewed
   - ☐ Part of household not interviewed: Col. Nos.

   Reason for non-interview:

7. Telephone No. ☐ No telephone

8. Best time to call

9. Name of interviewer (Code):

FOLLOW-UP RECORD

10. Record of calls for:		Date and time of call 1	2	3	4	5
Household	Date:					
	Time:					
Unrelated person	Date:					
	Time:					
Other *(Specify)*	Date:					
	Time:					

11. Reason for non-interview
   - ☐ Entire household not interviewed
   - ☐ Part of household not interviewed: Col. Nos.

   Reason for non-interview:

12. Name of interviewer (Code):

EDITING RECORD

13. Result ☐ Passed ☐ Failed →	Col. or Table No. (a)	Item or line in Table (b)	Type of error (c)	Reference in Interviewer's Manual (d)	17. No. persons in household
14. Follow-up ☐ Not necessary ☐ Telephone ☐ Personal			☐ Omitted ☐ Incomplete ☐ Inconsistent		
			☐ Omitted ☐ Incomplete ☐ Inconsistent		18. No. adults not interviewed for selves
			☐ Omitted ☐ Incomplete ☐ Inconsistent		
15. Editor			☐ Omitted ☐ Incomplete ☐ Inconsistent		19. No. lines filled in Table I
			☐ Omitted ☐ Incomplete ☐ Inconsistent		
16. Date			☐ Omitted ☐ Incomplete ☐ Inconsistent		

SPECIAL INTERVIEW RECORD

20. Special instructions

21. Record of calls

	1	2	3	4	5
Date:					
Time:					

22. Reason for non-interview

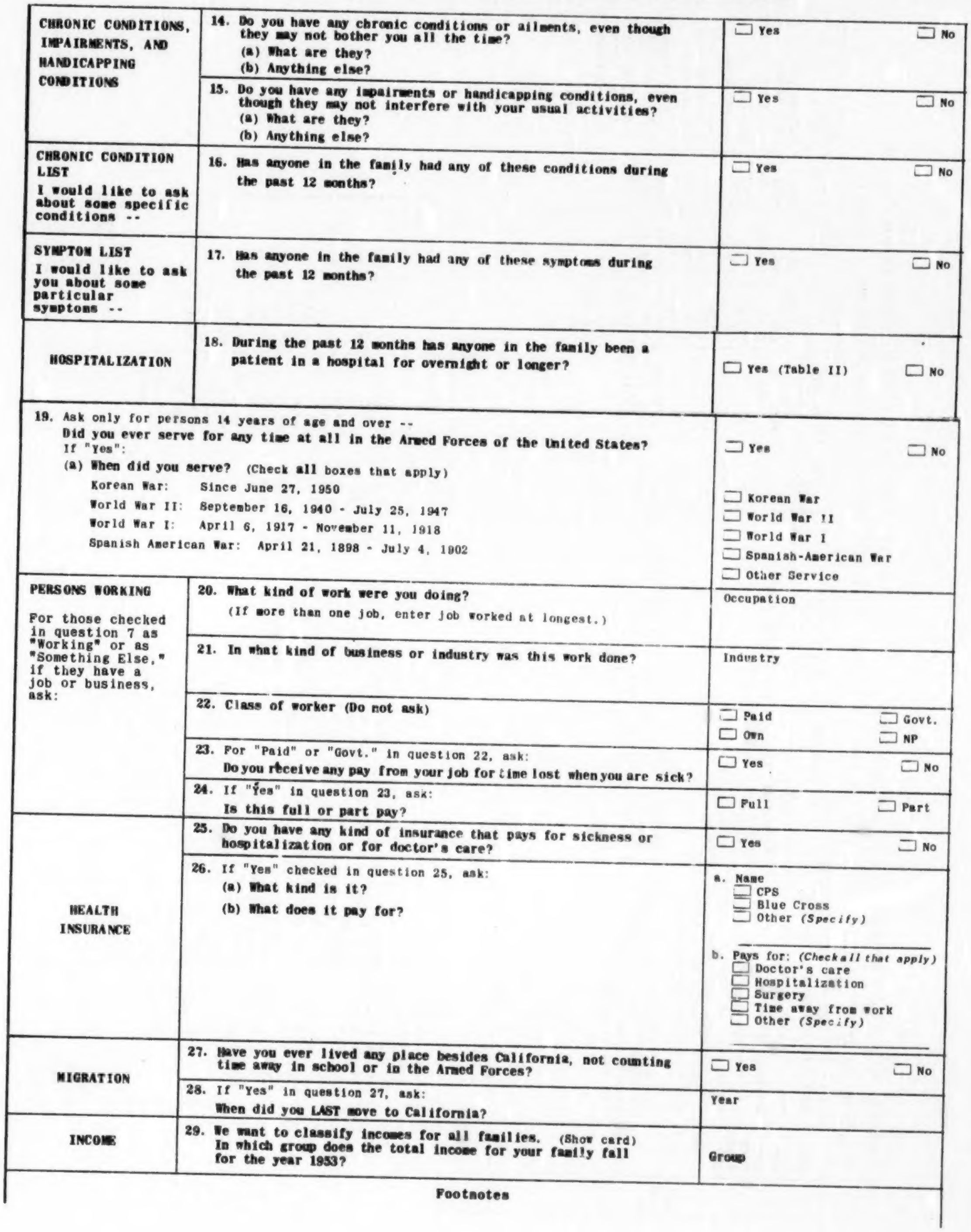
23. Name of interviewer

Comm-DC 24882

Figure E-7. Questionnaire: California Health Survey—Continued

	1. (a) **What is the name of the head of this household?** (Enter name in first column) (b) **What, are the names of all other persons who live here?** (List all persons who usually live here, and all persons staying here who have no usual place of residence elsewhere. List these persons in the prescribed order) (c) **Is there anyone else living here? any babies? any lodgers?** (If "Yes," to any part, add missed person to questionnaire) (d) **Have we missed anyone who is away on business? at school? on vacation? on a visit? temporarily in a hospital?** (If "Yes," to any part, add missed person to questionnaire if person meets definition of household member)	Last name (1) First name and initial
	2. **How are you related to the head of the household?** (Enter relationship to head, for example head, wife, daughter, grandson, mother-in-law, partner, lodger, lodger's wife, etc.)	Relationship
	3. **Race (Do not ask)** (Check one box for each person)	☐ White ☐ Negro ☐ Other
	4. **Sex** (Check one box for each person)	☐ Male ☐ Female
	5. **How old were you on your last birthday?** (If under one year of age, enter month of birth instead of age; e.g., May, June)	Age
	6. **Are you now married, widowed, divorced, separated or never married?** (Check one box for each person. For persons under 14 years, check "Never married.")	☐ Married ☐ Divorced ☐ Widowed ☐ Separated ☐ Never married
	7. **What were you doing most of the past 4 weeks -** working keeping house going to school **or something else?** If "something else," ask: **Are you unable to work, or something else?** (Check one box for each person)	☐ Working ☐ Keeping house ☐ Going to school ☐ Unable to work (long term disability, not short illness) ☐ Something else (e.g., retired, under school age)
I	Interview each adult person for himself for questions 8-18 and Tables I and II, if he is at home. Enter column number of respondent in each column.	☐ Responded for self Col. No. _______ was respondent
PAST 4 WEEKS - ILLNESS **We're interested in all kinds of illness, whether serious or not --**	8. **Were you sick at any time in the 4 weeks from Monday --- through last Sunday?** (a) **What was the matter?** (b) **Anything else?**	☐ Yes ☐ No
	9. **During these 4 weeks did you have any accidents or injuries - big or little - that happened around the house?** (a) **What happened?** (b) **Anything else?**	☐ Yes ☐ No
	10. **What about accidents or injuries away from home?** (a) **What happened?** (b) **Anything else?**	☐ Yes ☐ No
	11. **Did you feel the effects of an earlier accident or injury?** (a) **What was the matter?** (b) **Anything else?**	☐ Yes ☐ No
	12. **During these 4 weeks did you take any medicine or treatment prescribed by a doctor (besides for what you have already told me about)?** (a) **What was the matter?** (b) **Anything else?**	☐ Yes ☐ No
	13. **Did you take any other medicine or home remedies during these 4 weeks for any (other) condition?** (a) **What was the matter?** (b) **Anything else?**	☐ Yes ☐ No

Figure E-7. Questionnaire: California Health Survey—Continued



CHRONIC CONDITIONS, IMPAIRMENTS, AND HANDICAPPING CONDITIONS	14. Do you have any chronic conditions or ailments, even though they may not bother you all the time? (a) What are they? (b) Anything else?	☐ Yes ☐ No
	15. Do you have any impairments or handicapping conditions, even though they may not interfere with your usual activities? (a) What are they? (b) Anything else?	☐ Yes ☐ No
CHRONIC CONDITION LIST I would like to ask about some specific conditions --	16. Has anyone in the family had any of these conditions during the past 12 months?	☐ Yes ☐ No
SYMPTOM LIST I would like to ask you about some particular symptoms --	17. Has anyone in the family had any of these symptoms during the past 12 months?	☐ Yes ☐ No
HOSPITALIZATION	18. During the past 12 months has anyone in the family been a patient in a hospital for overnight or longer?	☐ Yes (Table II) ☐ No
19. Ask only for persons 14 years of age and over -- Did you ever serve for any time at all in the Armed Forces of the United States? If "Yes": (a) When did you serve? (Check all boxes that apply) Korean War: Since June 27, 1950 World War II: September 16, 1940 - July 25, 1947 World War I: April 6, 1917 - November 11, 1918 Spanish American War: April 21, 1898 - July 4, 1902		☐ Yes ☐ No ☐ Korean War ☐ World War II ☐ World War I ☐ Spanish-American War ☐ Other Service
PERSONS WORKING For those checked in question 7 as "Working" or as "Something Else," if they have a job or business, ask:	20. What kind of work were you doing? (If more than one job, enter job worked at longest.)	Occupation
	21. In what kind of business or industry was this work done?	Industry
	22. Class of worker (Do not ask)	☐ Paid ☐ Govt. ☐ Own ☐ NP
	23. For "Paid" or "Govt." in question 22, ask: Do you receive any pay from your job for time lost when you are sick?	☐ Yes ☐ No
	24. If "Yes" in question 23, ask: Is this full or part pay?	☐ Full ☐ Part
HEALTH INSURANCE	25. Do you have any kind of insurance that pays for sickness or hospitalization or for doctor's care?	☐ Yes ☐ No
	26. If "Yes" checked in question 25, ask: (a) What kind is it? (b) What does it pay for?	a. Name ☐ CPS ☐ Blue Cross ☐ Other *(Specify)* b. Pays for: *(Check all that apply)* ☐ Doctor's care ☐ Hospitalization ☐ Surgery ☐ Time away from work ☐ Other *(Specify)*
MIGRATION	27. Have you ever lived any place besides California, not counting time away in school or in the Armed Forces?	☐ Yes ☐ No
	28. If "Yes" in question 27, ask: When did you LAST move to California?	Year
INCOME	29. We want to classify incomes for all families. (Show card) In which group does the total income for your family fall for the year 1953?	Group
Footnotes		

Figure E-7. Questionnaire: California Health Survey—Continued

Table I - ILLNESSES AND INJURIES Circle "CC" in col. (m) if entry in col. (b) is 14, 15 or 16 or if condition is on Chronic Condition List, or if date in col. (h) is 3 months ago or longer.

Line No.	Col. No. of person	Question No.	Was a doctor seen about it?	What did the doctor say it was? --- did he use any medical terms? (If "No" in col. (c), enter condition; if symptom, enter both symptom and cause. If "effects," enter both effects and nature of injury.) (If accident or injury, enter "Accident" and fill Table A before completing Table I for the accident.)	IF DOCTOR WAS SEEN ("YES" IN COL. (c)):		If from Q. 14, 15, 16 or 17, ask:	When did ... start? or When did ... happen? If day not known ask: In which week did it start?	PAST FOUR WEEKS			
					When was a doctor LAST seen about...? (Month, day and Year)	What is the doctor's name and address? (Enter full name and street address, and city or county. Enter State if outside California.)	Did ... bother you at all during the past 4 weeks? (If "No," skip to col. (m))		During the past 4 weeks, how many days did ... keep you in bed either all or part of the day?	How many (other) days did ... keep you from going out of doors?	How many (other) days did ... keep you from your usual activities?	Altogether, that makes --- days. How many of these days: were you away from work were you away from school did you have to cut down on housework because of ...?
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
1						----------------						

Do you have chronic or repeated trouble (with) (because of) ...? (Circle "CC" below if condition is chronic; otherwise ask this question)	"YES" OR "CC" IN COL. (M)								
	When did you FIRST notice this condition? (Month and year. Year only if prior to 1953) If date same as (h), re-ask (h) for trouble in past 4 weeks.	About how many days in the past 12 months have you stayed in bed because of ...?	About how many (other) days altogether in the past 12 months did ... keep you from your usual activities?	Were you ever in a hospital overnight or longer because of ...? (Enter "No" or month and year of LAST hospitalization)	How often do you see a doctor for ..., regularly, or just once in a while or not at all?	Do you take medicine or treatments for ..., regularly, or just once in a while or not at all?	Please look at this card and read each statement. Then tell me which statement fits you best. (Show proper card)	If 1, 2, 3, or 4 in col. (t): Is this because of any of the conditions you have told me about?	If "Yes" in col. (u): Which?
(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)	(v)
No Skip (n)-(v) C-C → Yes →					☐ Reg ☐ No ☐ O	☐ Reg ☐ No ☐ O			

Figure E-7. Questionnaire: California Health Survey—Continued

TABLE II - HOSPITALIZATION DURING PAST TWELVE MONTHS

Line No.	Col. No. of person (a)	Question No. (b)	When did you enter the hospital? (Month, Year) (c)	How many days were you in the hospital, not counting the day you left? (d)	For what condition did you enter the hospital? (e)	Were any operations performed on you during this stay in the hospital? If "Yes,": (a) What was the operation? (f)
1						☐ No

What is the name and address of the hospital you were in? (Enter name, and city or county, and enter State if outside of California.) (g)	How many of these --- days were during the past 4 weeks? (h)	If "1" or more in col. (h) Were these days counted in the --- days you gave me before? (If "No," correct col. (i) of Table I) (i)
	☐ None or ______ days	☐ Yes ☐ No

TABLE A

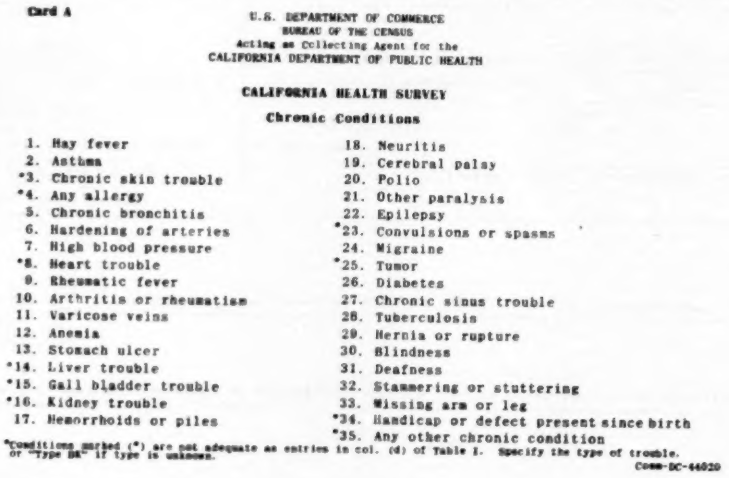
Line No. from Table I ______	1. What was the nature of the injury? (Specify type of injury and part of body affected.)

2. How did the accident happen? (Specify object which inflicted injury, or poisoning agent.)

3. Where did it happen?

Away from any house	Inside a house or on adjacent premises		
☐ Street, sidewalk or highway ☐ Farm ☐ Mine or quarry ☐ Industrial place or premises ☐ Place for recreation or sport ☐ Public building or place of entertainment ☐ Other *(Specify)* ______	a. Location: ☐ Room *(Specify)* ______ ☐ On steps or stairway in house ☐ Other location inside house *(Specify)* ______	☐ Yard ☐ Garage ☐ Outside steps or stairway ☐ Street or sidewalk ☐ Hotel rooms (not lobbies, halls, etc.) ☐ Other area adjoining house *(Specify)* ______	b. Did this happen at your own home or someone else's home? ☐ Own home ☐ Other home

Figure E-8. Cards used in conjunction with questionnaire: California Health Survey



Card A

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
Acting as Collecting Agent for the
CALIFORNIA DEPARTMENT OF PUBLIC HEALTH

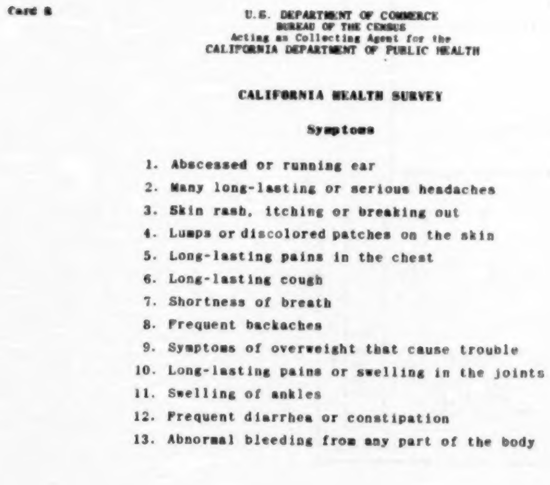
CALIFORNIA HEALTH SURVEY

Chronic Conditions

1. Hay fever
2. Asthma
*3. Chronic skin trouble
*4. Any allergy
5. Chronic bronchitis
6. Hardening of arteries
7. High blood pressure
*8. Heart trouble
9. Rheumatic fever
10. Arthritis or rheumatism
11. Varicose veins
12. Anemia
13. Stomach ulcer
*14. Liver trouble
*15. Gall bladder trouble
*16. Kidney trouble
17. Hemorrhoids or piles
18. Neuritis
19. Cerebral palsy
20. Polio
21. Other paralysis
22. Epilepsy
*23. Convulsions or spasms
24. Migraine
*25. Tumor
26. Diabetes
27. Chronic sinus trouble
28. Tuberculosis
29. Hernia or rupture
30. Blindness
31. Deafness
32. Stammering or stuttering
33. Missing arm or leg
*34. Handicap or defect present since birth
*35. Any other chronic condition

*Conditions marked (*) are not adequate as entries in col. (d) of Table I. Specify the type of trouble.
or "Type DK" if type is unknown.

Comm-DC-44020



Card B

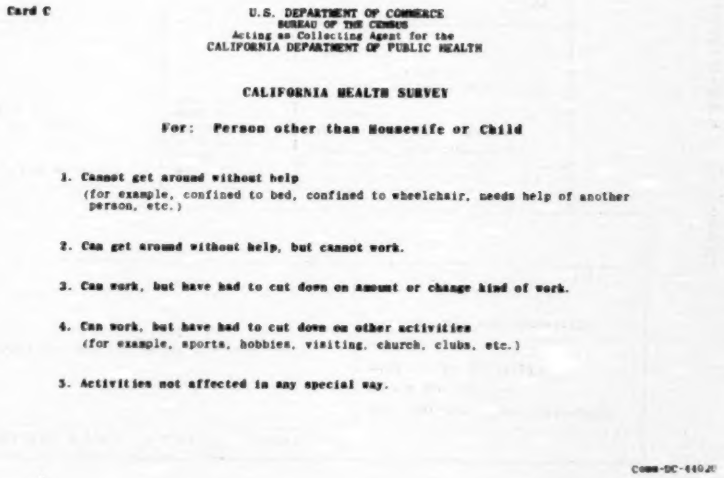
U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
Acting as Collecting Agent for the
CALIFORNIA DEPARTMENT OF PUBLIC HEALTH

CALIFORNIA HEALTH SURVEY

Symptoms

1. Abscessed or running ear
2. Many long-lasting or serious headaches
3. Skin rash, itching or breaking out
4. Lumps or discolored patches on the skin
5. Long-lasting pains in the chest
6. Long-lasting cough
7. Shortness of breath
8. Frequent backaches
9. Symptoms of overweight that cause trouble
10. Long-lasting pains or swelling in the joints
11. Swelling of ankles
12. Frequent diarrhea or constipation
13. Abnormal bleeding from any part of the body

Comm-DC-44020



Card C

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
Acting as Collecting Agent for the
CALIFORNIA DEPARTMENT OF PUBLIC HEALTH

CALIFORNIA HEALTH SURVEY

For: Person other than Housewife or Child

1. Cannot get around without help
(for example, confined to bed, confined to wheelchair, needs help of another person, etc.)

2. Can get around without help, but cannot work.

3. Can work, but have had to cut down on amount or change kind of work.

4. Can work, but have had to cut down on other activities
(for example, sports, hobbies, visiting, church, clubs, etc.)

5. Activities not affected in any special way.

Comm-DC-44020

Figure E-8. Cards used in conjunction with questionnaire: California Health Survey—Continued

Card D

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
Acting as Collecting Agent for the
CALIFORNIA DEPARTMENT OF PUBLIC HEALTH

CALIFORNIA HEALTH SURVEY

For: Housewife

1. **Cannot get around without help**
   (for example, confined to bed, confined to wheelchair, needs help of another person, etc.)
2. **Can get around without help, but cannot keep house.**
3. **Can keep house, but have had to cut down on amount or kind of housekeeping.**
4. **Can keep house, but have had to cut down on other activities**
   (for example, handiwork, visiting, church, clubs, etc.)
5. **Activities not affected in any special way.**

Comm-DC-44020

Card E

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
Acting as Collecting Agent for the
CALIFORNIA DEPARTMENT OF PUBLIC HEALTH

CALIFORNIA HEALTH SURVEY

For: Child

1. **Cannot get around without help**
   (for example, confined to bed, confined to wheelchair, needs help of another person, etc.)
2. **Can get around without help, but cannot go to school**
   (for children under six, could not go if old enough)
3. **Can go to school but is limited in other activities**
   (for example, limited in amount of play time, or needs special rest periods or special diet)
4. **Can go to school, but cannot take part in athletics, or uses special transportation, crutches or braces.**
5. **Activities not affected in any special way.**

Comm-DC-44020

Card F

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
Acting as Collecting Agent for the
CALIFORNIA DEPARTMENT OF PUBLIC HEALTH

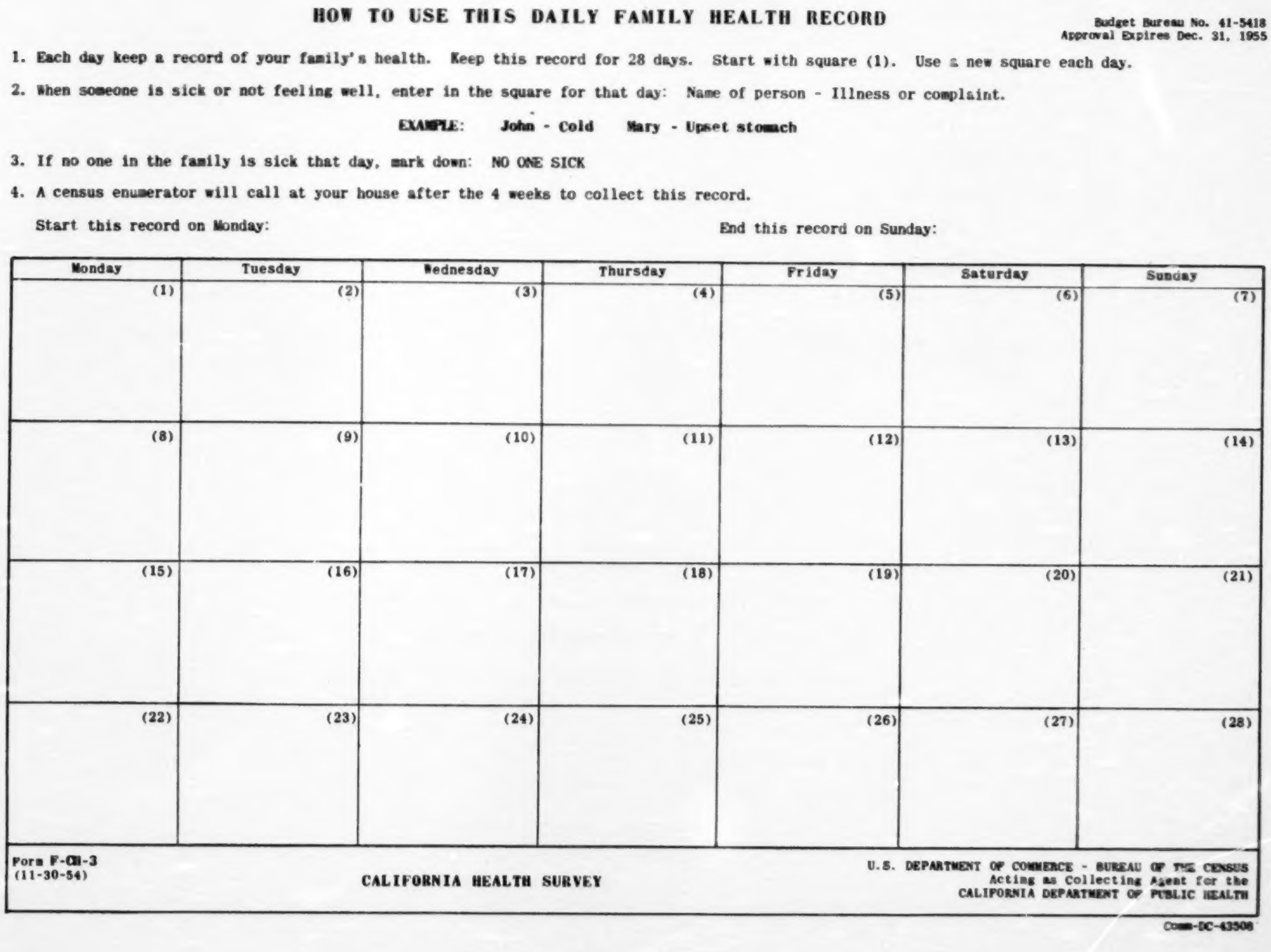
CALIFORNIA HEALTH SURVEY

Family Income for 1954

1. **Under $1,000**
2. **$1,000 to $1,999**
3. **$2,000 to $2,999**
4. **$3,000 to $3,999**
5. **$4,000 to $4,999**
6. **$5,000 to $5,999**
7. **$6,000 to $6,999**
8. **$7,000 and over**

Comm-DC-44020

Figure E-9. Health calendar: California Health Survey



HOW TO USE THIS DAILY FAMILY HEALTH RECORD

Budget Bureau No. 41-5418
Approval Expires Dec. 31, 1955

1. Each day keep a record of your family's health. Keep this record for 28 days. Start with square (1). Use a new square each day.
2. When someone is sick or not feeling well, enter in the square for that day: Name of person - Illness or complaint.

   EXAMPLE: **John - Cold** **Mary - Upset stomach**

3. If no one in the family is sick that day, mark down: NO ONE SICK
4. A census enumerator will call at your house after the 4 weeks to collect this record.

Start this record on Monday:

End this record on Sunday:

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
(1)	(2)	(3)	(4)	(5)	(6)	(7)
(8)	(9)	(10)	(11)	(12)	(13)	(14)
(15)	(16)	(17)	(18)	(19)	(20)	(21)
(22)	(23)	(24)	(25)	(26)	(27)	(28)

Form F-CH-3
(11-30-54)

CALIFORNIA HEALTH SURVEY

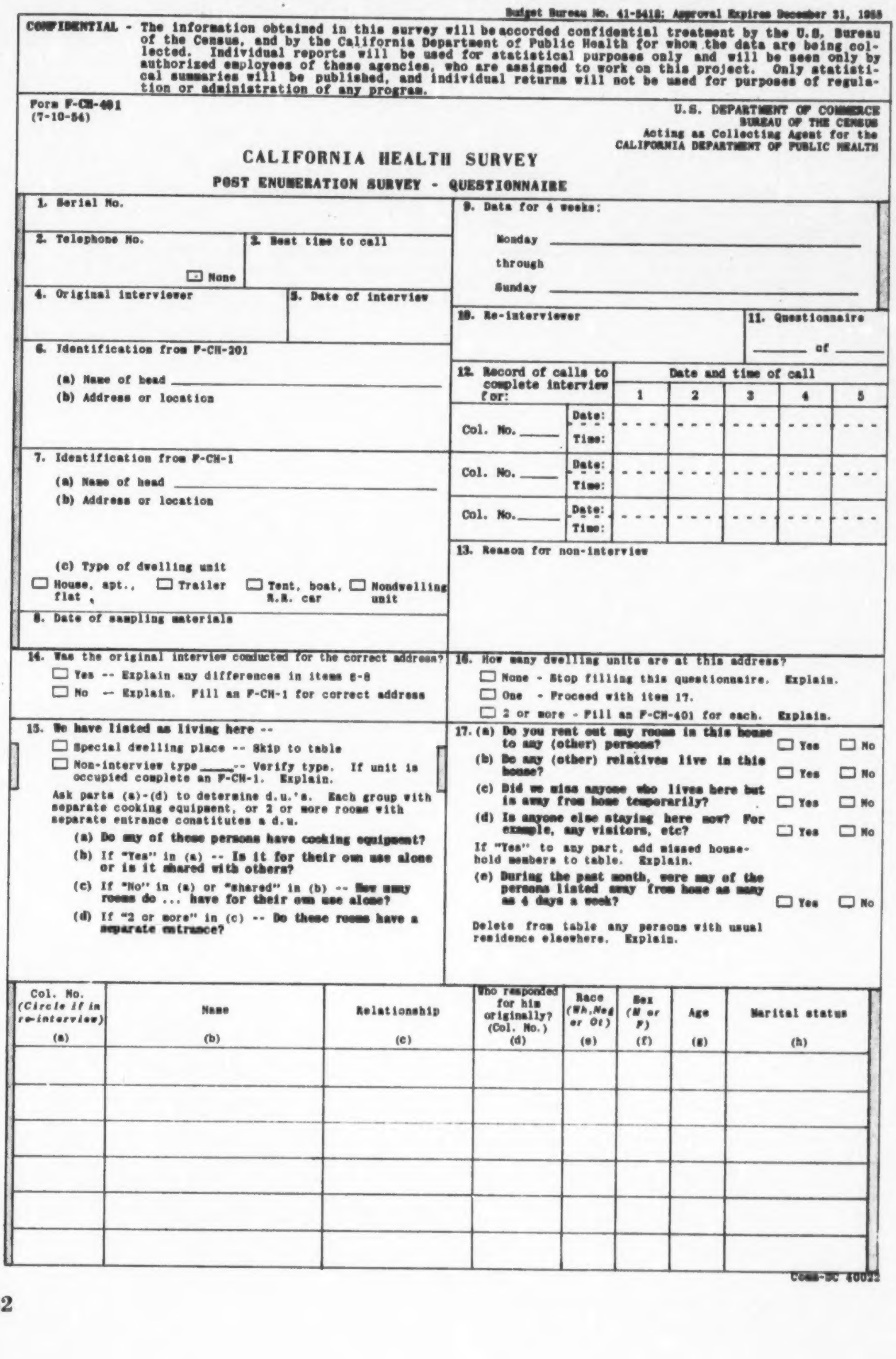
U.S. DEPARTMENT OF COMMERCE - BUREAU OF THE CENSUS
Acting as Collecting Agent for the
CALIFORNIA DEPARTMENT OF PUBLIC HEALTH

Comm-DC-43508

Figure E-10. Reinterview questionnaire: California Health Survey PES

The following pages show the exact content and wording of the questionnaire. The actual questionnaire included additional space for reports of more than one condition. Cards used in conjunction with the reinterview questionnaire were identical to those for the California Health Survey questionnaire (fig. E-8).

Figure E-10. Reinterview questionnaire: California Health Survey PES



Budget Bureau No. 41-5418; Approval Expires December 31, 1955

CONFIDENTIAL - The information obtained in this survey will be accorded confidential treatment by the U.S. Bureau of the Census, and by the California Department of Public Health for whom the data are being collected. Individual reports will be used for statistical purposes only and will be seen only by authorized employees of these agencies, who are assigned to work on this project. Only statistical summaries will be published, and individual returns will not be used for purposes of regulation or administration of any program.

Form F-CH-401
(7-10-54)

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
Acting as Collecting Agent for the
CALIFORNIA DEPARTMENT OF PUBLIC HEALTH

CALIFORNIA HEALTH SURVEY

POST ENUMERATION SURVEY - QUESTIONNAIRE

1. Serial No.

2. Telephone No. ☐ None

3. Best time to call

4. Original interviewer

5. Date of interview

6. Identification from F-CH-201

(a) Name of head ____________________

(b) Address or location

7. Identification from F-CH-1

(a) Name of head ____________________

(b) Address or location

(c) Type of dwelling unit

☐ House, apt., flat ☐ Trailer ☐ Tent, boat, R.R. car ☐ Nondwelling unit

8. Date of sampling materials

9. Data for 4 weeks:

Monday ____________________

through

Sunday ____________________

10. Re-interviewer

11. Questionnaire _____ of _____

12. Record of calls to complete interview for:		Date and time of call				
		1	2	3	4	5
Col. No. _____	Date:					
	Time:					
Col. No. _____	Date:					
	Time:					
Col. No. _____	Date:					
	Time:					

13. Reason for non-interview

14. Was the original interview conducted for the correct address?

☐ Yes -- Explain any differences in items 6-8

☐ No -- Explain. Fill an F-CH-1 for correct address

16. How many dwelling units are at this address?

☐ None - Stop filling this questionnaire. Explain.

☐ One - Proceed with item 17.

☐ 2 or more - Fill an F-CH-401 for each. Explain.

15. **We have listed as living here --**

☐ Special dwelling place -- Skip to table

☐ Non-interview type _____ -- Verify type. If unit is occupied complete an F-CH-1. Explain.

Ask parts (a)-(d) to determine d.u.'s. Each group with separate cooking equipment, or 2 or more rooms with separate entrance constitutes a d.u.

(a) **Do any of these persons have cooking equipment?**

(b) If "Yes" in (a) -- **Is it for their own use alone or is it shared with others?**

(c) If "No" in (a) or "shared" in (b) -- **How many rooms do ... have for their own use alone?**

(d) If "2 or more" in (c) -- **Do these rooms have a separate entrance?**

17. (a) **Do you rent out any rooms in this house to any (other) persons?** ☐ Yes ☐ No

(b) **Do any (other) relatives live in this house?** ☐ Yes ☐ No

(c) **Did we miss anyone who lives here but is away from home temporarily?** ☐ Yes ☐ No

(d) **Is anyone else staying here now? For example, any visitors, etc?** ☐ Yes ☐ No

If "Yes" to any part, add missed household members to table. Explain.

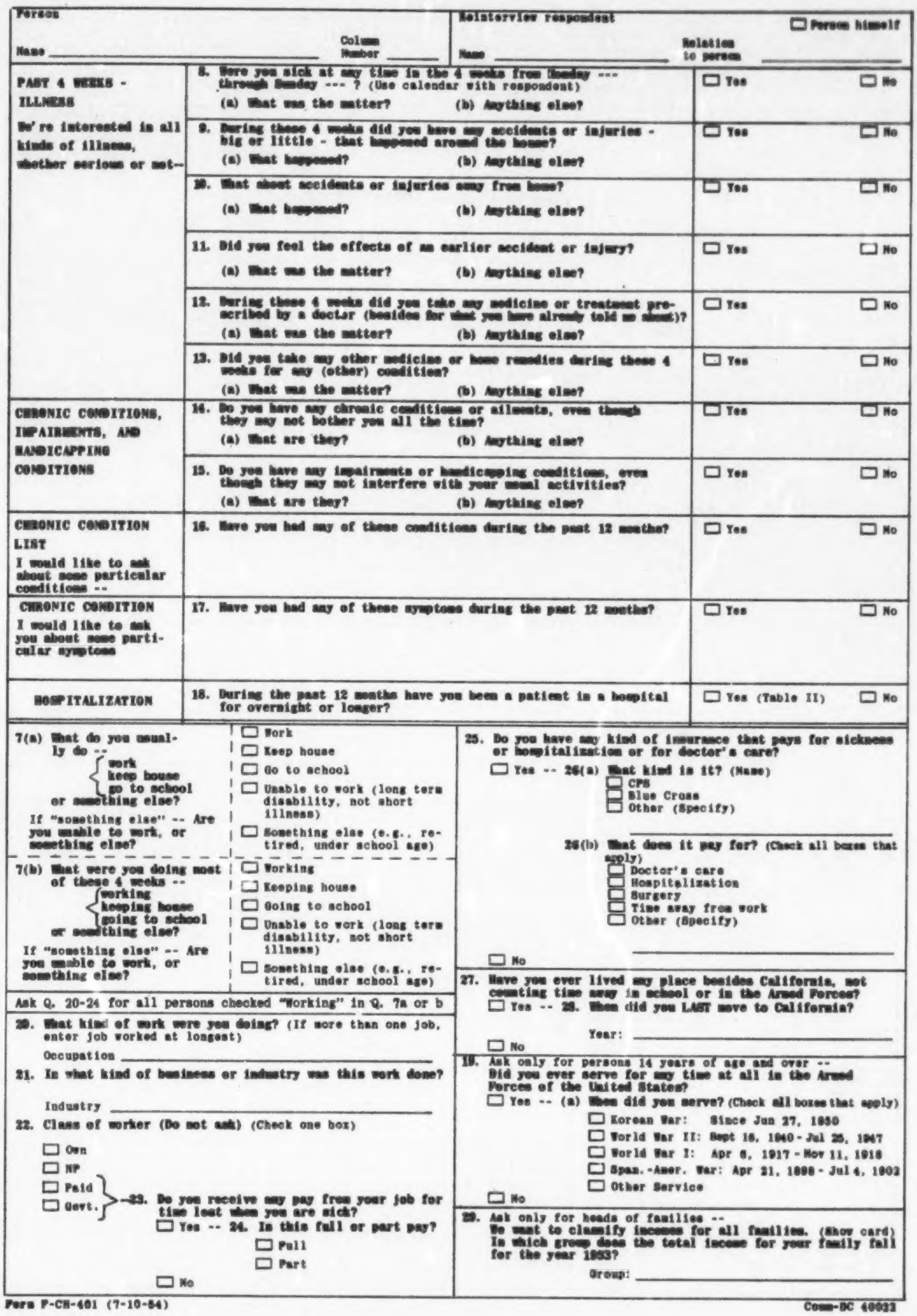
(e) **During the past month, were any of the persons listed away from home as many as 4 days a week?** ☐ Yes ☐ No

Delete from table any persons with usual residence elsewhere. Explain.

Col. No. *(Circle if in re-interview)* (a)	Name (b)	Relationship (c)	Who responded for him originally? (Col. No.) (d)	Race *(Wh, Neg or Ot)* (e)	Sex *(M or F)* (f)	Age (g)	Marital status (h)

Comm-DC 40022

Figure E-10. Reinterview questionnaire: California Health Survey PES—Continued



Person Name ______________________ Column Number ______	Reinterview respondent ☐ Person himself Name ______________________ Relation to person ______________

PAST 4 WEEKS - ILLNESS We're interested in all kinds of illness, whether serious or not--	8. Were you sick at any time in the 4 weeks from Monday --- through Sunday --- ? (Use calendar with respondent) (a) What was the matter? (b) Anything else?	☐ Yes ☐ No
	9. During these 4 weeks did you have any accidents or injuries - big or little - that happened around the house? (a) What happened? (b) Anything else?	☐ Yes ☐ No
	10. What about accidents or injuries away from home? (a) What happened? (b) Anything else?	☐ Yes ☐ No
	11. Did you feel the effects of an earlier accident or injury? (a) What was the matter? (b) Anything else?	☐ Yes ☐ No
	12. During these 4 weeks did you take any medicine or treatment prescribed by a doctor (besides for what you have already told me about)? (a) What was the matter? (b) Anything else?	☐ Yes ☐ No
	13. Did you take any other medicine or home remedies during these 4 weeks for any (other) condition? (a) What was the matter? (b) Anything else?	☐ Yes ☐ No
CHRONIC CONDITIONS, IMPAIRMENTS, AND HANDICAPPING CONDITIONS	14. Do you have any chronic conditions or ailments, even though they may not bother you all the time? (a) What are they? (b) Anything else?	☐ Yes ☐ No
	15. Do you have any impairments or handicapping conditions, even though they may not interfere with your usual activities? (a) What are they? (b) Anything else?	☐ Yes ☐ No
CHRONIC CONDITION LIST I would like to ask about some particular conditions --	16. Have you had any of these conditions during the past 12 months?	☐ Yes ☐ No
CHRONIC CONDITION I would like to ask you about some particular symptoms	17. Have you had any of these symptoms during the past 12 months?	☐ Yes ☐ No
HOSPITALIZATION	18. During the past 12 months have you been a patient in a hospital for overnight or longer?	☐ Yes (Table II) ☐ No

7(a) What do you usually do -- work, keep house, go to school or something else? If "something else" -- Are you unable to work, or something else?	☐ Work ☐ Keep house ☐ Go to school ☐ Unable to work (long term disability, not short illness) ☐ Something else (e.g., retired, under school age)
7(b) What were you doing most of these 4 weeks -- working, keeping house, going to school or something else? If "something else" -- Are you unable to work, or something else?	☐ Working ☐ Keeping house ☐ Going to school ☐ Unable to work (long term disability, not short illness) ☐ Something else (e.g., retired, under school age)

Ask Q. 20-24 for all persons checked "Working" in Q. 7a or b

20. What kind of work were you doing? (If more than one job, enter job worked at longest)

Occupation ______________________

21. In what kind of business or industry was this work done?

Industry ______________________

22. Class of worker (Do not ask) (Check one box)

☐ Own
☐ NP
☐ Paid
☐ Govt.

(Paid, Govt.) -- 23. Do you receive any pay from your job for time lost when you are sick?
☐ Yes -- 24. Is this full or part pay?
☐ Full
☐ Part
☐ No

25. Do you have any kind of insurance that pays for sickness or hospitalization or for doctor's care?
☐ Yes -- 26(a) What kind is it? (Name)
☐ CPS
☐ Blue Cross
☐ Other (Specify) ______________________
26(b) What does it pay for? (Check all boxes that apply)
☐ Doctor's care
☐ Hospitalization
☐ Surgery
☐ Time away from work
☐ Other (Specify) ______________________
☐ No

27. Have you ever lived any place besides California, not counting time away in school or in the Armed Forces?
☐ Yes -- 28. When did you LAST move to California?
Year: ______________________
☐ No

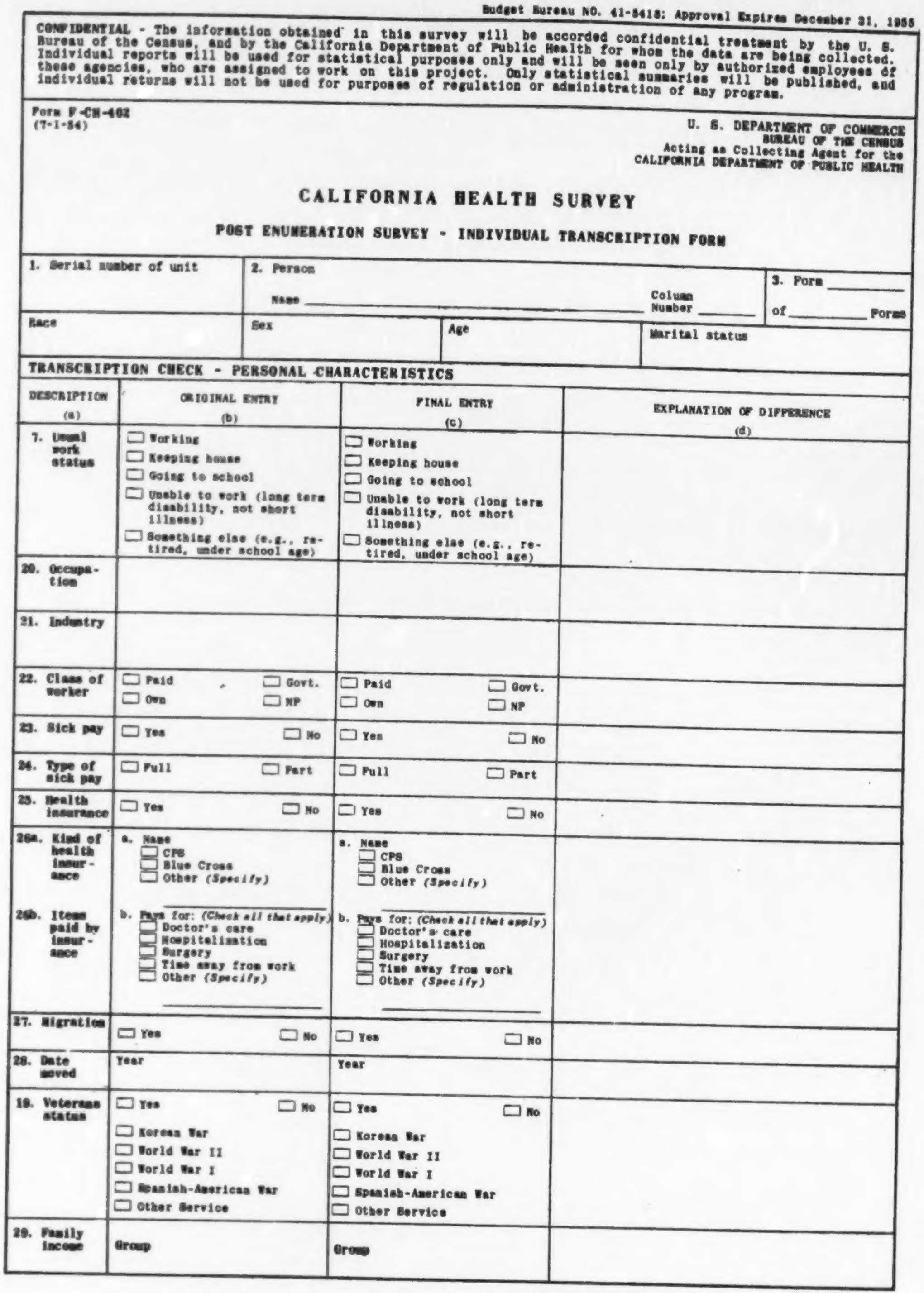
19. Ask only for persons 14 years of age and over --
Did you ever serve for any time at all in the Armed Forces of the United States?
☐ Yes -- (a) When did you serve? (Check all boxes that apply)
☐ Korean War: Since Jun 27, 1950
☐ World War II: Sept 16, 1940 - Jul 25, 1947
☐ World War I: Apr 6, 1917 - Nov 11, 1918
☐ Span.-Amer. War: Apr 21, 1898 - Jul 4, 1902
☐ Other Service
☐ No

29. Ask only for heads of families --
We want to classify incomes for all families. (Show card)
In which group does the total income for your family fall for the year 1953?
Group: ______________________

Form P-CH-401 (7-10-54)

Comm-DC 40032

Figure E-10. Reinterview questionnaire: California Health Survey PES—Continued



Budget Bureau NO. 41-5418; Approval Expires December 31, 1955

CONFIDENTIAL - The information obtained in this survey will be accorded confidential treatment by the U. S. Bureau of the Census, and by the California Department of Public Health for whom the data are being collected. Individual reports will be used for statistical purposes only and will be seen only by authorized employees of these agencies, who are assigned to work on this project. Only statistical summaries will be published, and individual returns will not be used for purposes of regulation or administration of any program.

Form F-CH-462
(7-1-54)

U. S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
Acting as Collecting Agent for the
CALIFORNIA DEPARTMENT OF PUBLIC HEALTH

CALIFORNIA HEALTH SURVEY

POST ENUMERATION SURVEY - INDIVIDUAL TRANSCRIPTION FORM

1. Serial number of unit
2. Person Name ____________ Column Number ______
3. Form ______ of ______ Forms

Race
Sex
Age
Marital status

TRANSCRIPTION CHECK - PERSONAL CHARACTERISTICS

DESCRIPTION (a)	ORIGINAL ENTRY (b)	FINAL ENTRY (c)	EXPLANATION OF DIFFERENCE (d)
7. Usual work status	☐ Working ☐ Keeping house ☐ Going to school ☐ Unable to work (long term disability, not short illness) ☐ Something else (e.g., retired, under school age)	☐ Working ☐ Keeping house ☐ Going to school ☐ Unable to work (long term disability, not short illness) ☐ Something else (e.g., retired, under school age)	
20. Occupation			
21. Industry			
22. Class of worker	☐ Paid ☐ Govt. ☐ Own ☐ NP	☐ Paid ☐ Govt. ☐ Own ☐ NP	
23. Sick pay	☐ Yes ☐ No	☐ Yes ☐ No	
24. Type of sick pay	☐ Full ☐ Part	☐ Full ☐ Part	
25. Health insurance	☐ Yes ☐ No	☐ Yes ☐ No	
26a. Kind of health insurance 26b. Items paid by insurance	a. Name ☐ CPS ☐ Blue Cross ☐ Other *(Specify)* ______ b. Pays for: *(Check all that apply)* ☐ Doctor's care ☐ Hospitalization ☐ Surgery ☐ Time away from work ☐ Other *(Specify)* ______	a. Name ☐ CPS ☐ Blue Cross ☐ Other *(Specify)* ______ b. Pays for: *(Check all that apply)* ☐ Doctor's care ☐ Hospitalization ☐ Surgery ☐ Time away from work ☐ Other *(Specify)* ______	
27. Migration	☐ Yes ☐ No	☐ Yes ☐ No	
28. Date moved	Year	Year	
19. Veterans status	☐ Yes ☐ No ☐ Korean War ☐ World War II ☐ World War I ☐ Spanish-American War ☐ Other Service	☐ Yes ☐ No ☐ Korean War ☐ World War II ☐ World War I ☐ Spanish-American War ☐ Other Service	
29. Family income	Group	Group	

Comm-DC 27665

Figure E-10. Reinterview questionnaire: California Health Survey PES—Continued

TABLE I - ILLNESSES AND INJURIES

Circle "CC" in col. (m) if from question 14, 15 or 16 or if condition is on Chronic Condition List, or if date in col. (h) is 3 months ago or longer.

Line No.	TRAN-SCRIP-TION CHECK (Enter "V," "O" or "U")	Was a doctor seen about it?	What did the doctor say it was? --- did he use any medical terms? (If "No" in col. (c), enter condition; if symptom, enter both symptom and cause. If "effects," enter both effects and nature of injury.) (If accident or injury, enter "Accident" and fill Table A before completing Table I for the accident.)	IF DOCTOR WAS SEEN ("YES" IN COL. (c)):		If from Q. 14, 15, 16 or 17, ask:	When did ... start? or When did ... happen? If day not known ask: In which week did it start?
				When was a doctor LAST seen about...? (Month, day and Year)	What is the doctor's name and address? (Enter full name and street address, and city or county. Enter State if outside California.)	Did ... bother you at all during the past 4 weeks? (If "No," skip to col. (m))	
	(w)	(c)	(d)	(e)	(f)	(g)	(h)
1							

PAST FOUR WEEKS				Do you have chronic or repeated trouble (with) (because of) ...? (Circle "CC" below if condition is chronic; otherwise ask this question)	"YES" OR "CC" IN COL. (M)							If 1, 2, 3, or 4 in col. (t):	If "Yes" in col. (u):
During the past 4 weeks, how many days did ... keep you in bed either all or part of the day?	How many (other) days did... keep you from going out of doors?	How many (other) days did... keep you from your usual activities?	Altogether, that makes --- days. How many of these days: were you away from work were you away from school did you have to cut down on housework because of ...?		When did you FIRST notice this condition? (Month and year. Year only if prior to 1953) If date same as (h), re-ask (h) for trouble in past 4 weeks.	About how many days in the past 12 months have you stayed in bed because of ...?	About how many (other) days altogether in the past 12 months did... keep you from your usual activities?	Were you ever in a hospital overnight or longer because of ...? (Enter "No" or month and year of LAST hospitalization)	How often do you see a doctor for ..., regularly, or just once in a while or not at all?	Do you take medicine or treatments for ..., regularly, or just once in a while or not at all?	Please look at this card and read each statement. Then tell me which statement fits you best. (Show proper card)	Is this because of any of the conditions you have told me about?	Which?
(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)	(v)
				No Skip (n)-(v) C-C → Yes →					☐ Reg ☐ No ☐ 0	☐ Reg ☐ No ☐ 0			

Figure E-10. Reinterview questionnaire: California Health Survey PES—Continued

TABLE II - HOSPITALIZATION DURING PAST TWELVE MONTHS

Line No.	TRAN-SCRIP-TION CHECK (Enter "V," "O" or "U") (j)	When did you enter the hospital? (Month, Year) (c)	How many days were you in the hospital, not counting the day you left? (d)	For what condition did you enter the hospital? (e)	Were any operations performed on you during this stay in the hospital? If "Yes,": (a) What was the operation? (f)
1					☐ No
2					☐ No

What is the name and address of the hospital you were in? (Enter name, and city or county, and enter State if outside of California.) (g)	How many of these --- days were during the past 4 weeks? (h)	If "1" or more in col. (h) Were these days counted in the --- days you gave me before? (If "No," correct col. (f) of Table I) (i)
	☐ None or ______ days	☐ Yes ☐ No
	☐ None or ______ days	☐ Yes ☐ No

Figure E-10. Reinterview questionnaire: California Health Survey PES—Continued

TABLE A

Line No. from Table I	**1. What was the nature of the injury?** (Specify type of injury and part of body affected.)

2. How did the accident happen? (Specify object which inflicted injury, or poisoning agent.)

3. Where did it happen?

Away from any house	Inside a house or on adjacent premises		
☐ Street, sidewalk or highway ☐ Farm ☐ Mine or quarry ☐ Industrial place or premises ☐ Place for recreation or sport ☐ Public building or place of entertainment ☐ Other *(Specify)*	**a. Location:** ☐ Room *(Specify)* ☐ On steps or stairway in house ☐ Other location inside house *(Specify)*	☐ Yard ☐ Garage ☐ Outside steps or stairway ☐ Street or sidewalk ☐ Hotel rooms (*not* lobbies, halls, etc.) ☐ Other area adjoining house *(Specify)*	**b. Did this happen at your own home or someone else's home?** ☐ Own home ☐ Other home

REMARKS

TRANSCRIPTION CHECK - Explain all lines marked "O" or "U" and all differences between original and final entries in items on any other line in Table I and II or in Table A.

TABLE (a)	LINE (b)	ITEM (c)	EXPLANATION OF DIFFERENCE (d)

Appendix F. Illness Attitudes and Morbidity Reporting

The San Jose Survey included an exploration of the interrelations between illness attitudes and morbidity reporting. Although the results were not easy to interpret, it seems worthwhile to make them available to research workers interested in this important area.

The interviewers in the San Jose Survey were given a series of tests relating to their aptitudes and to their attitudes toward various factors relevant to the survey, including their attitude toward illness. In one of these tests the interviewer was asked whether she would consider a person 14 years of age or older "to be sick or not sick today if he or she had one of the following symptoms," and a list of 12 symptoms followed. The interviewer was asked to classify the same set of 12 symptoms for a child under 14 years of age. (See discussion of table 66.) In order to present a reduced number of items to the household survey reporter, 6 of the original 12 items were selected for use in the questionnaire for the second repeat interviews of group II. These symptoms, selected because they represented a wide range of marginals, were fever, upset stomach, dizziness, running nose, rapid pulse, and tooth extraction. The household reporter was asked: "Would you consider a person 14 years of age or older to be sick or not today, if he or she had . . .?," and the list of symptoms was read. The question and list of symptoms was repeated for "a child under 14 years of age." In the questionnaire for reinterviewed nonreporters in the second and third repeat interviews of

Table F-1. Percentage distribution of reporters by number of symptoms designated as sickness, with reference to children under 14 years and persons 14 years and over: San Jose, May [1] 1952

(Excludes reporters gained by the panel in May)

Illness attitude—number of symptoms designated as sickness by each reporter	Question [2] referring to persons—	
	Under 14 years	14 years and over
All reporters	100	100
0–2	21	39
0	3	5
1	6	15
2	11	19
3–4	37	34
3	15	19
4	21	16
5–6	40	24
5	18	13
6	22	11
Not ascertained	3	3
Measure of sample size	*5.4*	*5.4*

[1] Group II, second repeat interviews.

[2] Question 62(a), "Would you consider a person 14 years of age or older to be sick or not today if he or she had: (1) Fever, (2) Upset stomach, (3) Dizziness, (4) Running nose, (5) Rapid pulse, (6) Tooth extraction." In question 62(b), the reference was to "a child under 14 years of age," covering the same symptoms.

Table F-2. Percentage distribution of reporters and reinterviewed nonreporters by number of symptoms designated as sickness with reference to children under 14 years and persons 14 years and over, and percentage disagreement between reporters and reinterviewed nonreporters in the same household as to number of symptoms designated as sickness for the two age groups: San Jose reinterview sample, May–June [1] 1952

(Figures are weighted inversely as the number of nonreporters in the household and are representative of adults from households in which there were one or more adult nonreporters)

Illness attitude—number of symptoms designated as sickness by each adult	Question [2] referring to persons—			
	Under 14 years		14 years and over	
	Reporter	Reinterviewed nonreporter	Reporter	Reinterviewed nonreporter
Total	100	100	100	100
0–2	21	25	33	36
3–4	34	26	33	27
5–6	40	41	29	29
Not ascertained	5	8	5	8
Percent of disagreement [3]	73		70	
Measure of sample size	*1.8*	*1.8*	*1.8*	*1.8*

[1] Group II, second and third repeat interviews. Based on one person in each of 118 households.

[2] See footnote 2, table F-1.

[3] Percent of cases in which the reporter and nonreporter within the same household did not agree as to the number of symptoms, using the following eight classes: 0, 1, 2, 3, 4, 5, 6, number not ascertained.

Table F-3. Percentage distribution of persons by illness attitudes, expressed by reporters and assigned to nonreporters in the same household, according to age: San Jose, May [1] 1952

(Excludes persons gained by the panel in May)

Illness attitude—number of symptoms designated as sickness by each reporter	Reporter				Nonreporters in same household					
	Question [2] referring to persons—									
	14 years and over				In both age groups [3]	Under 14 years	14 years and over			
	Age of reporter				Age of nonreporter					
	18 and over	18-44	45-64	65 and over	All ages	Under 15	15 and over	15-44	45-64	65 and over
Total	100	100	100	100	100	100	100	100	100	100
0-2	39	42	32	42	30	18	37	38	32	43
3-4	34	38	30	29	35	40	33	33	32	34
5-6	24	18	32	29	32	42	27	26	32	15
Not ascertained	3	2	6	—	2	—	3	2	3	9
Measure of sample size	*5.4*	*3.0*	*1.6*	*0.8*	*9.3*	*3.4*	*5.9*	*3.4*	*1.8*	*0.7*

[1] Group II, second repeat interviews.
[2] See footnote 2, table F-1.
[3] The number of symptoms designated as sickness for nonreporers under 14 years is obtained from question 62(b), while that for nonreporters 14 years or over is obtained from question 62(a).

Table F-4. Percentage of persons with second repeat interviews who had the same respondent on preceding and subsequent interviews, by illness attitude and respondent type: San Jose, March-June [1] 1952

Illness attitude—number of symptoms designated as sickness by each reporter [2]	Same-self respondent or proxy respondent for second repeat interview as for—			*Measure of sample size*
	Third repeat interview	First and third repeat interviews	Original, first, and third repeat interviews	
ALL PERSONS				
Total	68	56	45	*15*
0-2	73	57	47	*5.0*
3-4	73	60	48	*5.2*
5-6	66	57	47	*4.3*
ADULT REPORTERS				
Total	73	61	52	*5.4*
0-2	78	63	56	*2.1*
3-4	74	61	50	*1.8*
5-6	73	65	57	*1.3*
NONREPORTERS				
Total	66	53	41	*9.3*
0-2	69	52	40	*2.8*
3-4	72	59	46	*3.3*
5-6	63	53	43	*3.0*

[1] Group II, initial, first, second, and third repeat interviews.
[2] See footnote 2, table F-1 for questions on illness attitude asked in the second repeat interview and table F-3 for method of assigning to nonreporters the illness attitudes of reporters.

group II the same questions on illness attitudes were also asked.

The response patterns to this question proved not to be scalable in the Guttman sense (*20*). However, persons were classified according to the number of symptoms which they designated as "sickness." This number had a possible range from 0 to 6. The distribution of reporters according to the number of symptoms classified as sickness is shown in table F-1. Somewhat more symptoms in children were designated as sickness than in adults. This grouping of reporters into three approximately equal categories—0-2 symptoms designated as sickness, 3-4 symptoms, and 5-6 symptoms—will be used later in relating these attitudinal data to levels of morbidity reporting.

An indication of the consistency of illness attitudes among persons within the same household may be obtained from the part of the San Jose Survey which involved direct reinterviews of a subsample of nonreporters (see discussion of table 42). In table F-2, the number of symptoms designated as sickness by a household reporter and, independently, by a reinterviewed nonreporter from the same household are contrasted. While lack of agreement between reporters and nonreporters in the same household as to the number of symptoms constituting sickness is large, around 70 percent, the distributions of responses are similar.

The prime objective of obtaining data on illness attitudes was to see how these data might be related to the levels of morbidity reported. It was hypothesized that persons who designated more symptoms as illness would

Table F-5. Incidence of illness per 100 persons per month by illness attitude, respondent type, and illness type and severity: San Jose, February-May[1] 1952

(Includes only persons whose respondent was the same for four consecutive monthly interviews)

Illness attitude—number of symptoms designated as sickness by each reporter[2]	Total illness			Acute illness			Chronic illness			*Measure of sample size*
	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	
ALL PERSONS										
Total	22	13	9	17	11	7	5	3	2	*27*
0-2	22	14	8	19	12	7	3	2	1	*9.3*
3-4	26	16	11	20	12	8	6	4	2	*9.9*
5-6	16	10	6	12	8	4	5	2	2	*8.1*
ADULT REPORTERS										
Total	25	15	10	18	11	7	7	4	3	*12*
0-2	26	17	8	22	15	7	4	3	1	*4.8*
3-4	26	15	11	16	8	8	10	7	3	*3.8*
5-6	23	14	9	16	10	6	8	4	4	*3.0*
NONREPORTERS, AGE UNDER 15										
Total	24	16	8	22	15	7	3	[illegible]	1	*7.7*
0-2	25	14	11	23	13	10	2	1	1	*1.4*
3-4	33	23	10	29	20	9	4	3	1	*3.5*
5-6	13	9	5	12	8	4	[illegible]	—	1	*2.9*
NONREPORTERS, AGE 15 AND OVER										
Total	15	8	7	12	7	5	3	1	2	*8.1*
0-2	15	9	7	[illegible]	8	6	1	1	—	*3.2*
3-4	18	8	10	14	6	8	4	2	2	*2.7*
5-6	11	8	3	6	5	1	5	3	2	*2.2*

---

[1] Incidence of illness from group II, initial, first, second, and third repeat interviews.

[2] See footnote 2, table F-1 for questions on illness attitude asked in the second repeat interview and table F-3 for method of assigning to nonreporters the illness attitudes of reporters.

report greater levels of morbidity than persons who designated fewer symptoms as illness.

It was already known that morbidity levels varied with age. Therefore, it was important to investigate the relation between illness attitudes and age in order to insure that apparent relationships between illness attitudes and morbidity levels could not be accounted for by an age factor. Table F-3 shows the percentage distribution of illness attitudes by age group. The attitudes expressed by reporters do not vary appreciably by age. The attitudes assigned to nonreporters in the same households represent the illness attitudes of the reporters who furnished morbidity and other information for the nonreporters. The distributions of illness attitudes for adult nonreporters 15 years of age and over does not vary appreciably with age. Also, for both reporters and nonreporters, the distributions for females were about the same as those for males. Accordingly, in subsequent analyses relating illness attitudes to morbidity levels we shall not control on age and sex.

The question on attitudes toward illness was asked of reporters in the second repeat interviews of group II. In order to obtain a more stable picture of the morbidity experience of persons in group II, data for all 4 months of interviewing (one initial interview and three repeat interviews) were examined. In different months in the sample, the household reporters sometimes changed. Also, persons were not always in the sample for all 4 months. Therefore, in order to decrease the difficulties in interpretation of the data, the analyses which include

Table F-6. Incidence of illness per 100 persons per month by illness attitude, respondent type, and illness type and severity: San Jose, April [1] 1952

(Excludes persons gained by the panel in May. Illness data include responses to supplemental questions 57-59 and 61. See part I, section 1)

Illness attitude—number of symptoms designated as sickness by each reporter [2]	Total illness			Acute illness			Chronic illness			*Measure of sample size*
	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	
ALL PERSONS										
Total	27	13	14	20	10	10	7	3	4	*15*
0-2	26	9	17	21	7	13	5	1	4	*5.0*
3-4	30	15	15	22	12	10	8	3	5	*5.2*
5-6	26	15	11	18	9	9	8	5	3	*4.3*
ADULT REPORTERS										
Total	42	17	24	29	13	17	12	5	8	*5.4*
0-2	40	13	27	33	12	20	7	1	7	*2.1*
3-4	45	20	23	28	15	13	16	6	10	*1.8*
5-6	45	21	23	28	11	17	17	11	6	*1.3*
NONREPORTERS, AGE UNDER 15										
Total	25	15	10	23	14	9	1	1	—	*3.4*
0-2	25	10	15	25	10	15	—	—	—	*.6*
3-4	32	20	13	31	20	11	1	—	1	*1.3*
5-6	17	13	4	15	11	4	2	2	—	*1.4*
NONREPORTERS, AGE 15 AND OVER										
Total	15	7	8	9	4	5	6	3	3	*5.9*
0-2	13	4	8	8	2	6	5	2	3	*2.2*
3-4	16	7	9	10	5	5	6	2	4	*1.9*
5-6	18	10	8	12	6	6	6	4	2	*1.6*

---

[1] Incidence of illness from group II, second repeat interviews.

[2] See footnote 2, table F-1 for questions on illness attitude asked in the second repeat interview and table F-3 for method of assigning to nonreporters the illness attitudes of reporters.

Table F-7. Incidence of illness per 100 reinterviewed nonreporters per month by illness attitude and illness type and severity: San Jose reinterview sample, April–May [1] 1952

(Figures are weighted inversely as the number of nonreporters in the household and are representative of adults from households in which there were one or more adult nonreporters. Illness data include responses to supplemental question 61. See part I, section 1)

Illness attitude—number of symptoms designated as sickness by each reinterviewed nonreporter [2]	Total illness			Acute illness			Chronic illness			*Measure of sample size*
	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	
REINTERVIEWED NONREPORTERS										
Total	30	16	14	21	10	11	9	6	3	*1.8*
0–2	28	13	15	19	9	9	9	4	6	*.6*
3–4	24	10	15	17	5	12	7	5	2	*.5*
5–6	42	28	14	30	19	12	12	9	2	*.5*

[1] Incidence of illness from group II, second and third repeat interviews. Based on 1 person in each of 118 households.

[2] See footnote 2, table F-1 for questions on illness attitude asked in the second or third repeat interviews.

all 4 interview months for group II include only those persons, reporters and nonreporters, with second repeat interviews who had the same respondent on preceding and subsequent interviews. The result of these restrictions is indicated in table F-4. The respondent remained the same for all 4 months for only 45 percent of the persons for whom information on illness attitudes was obtained in the second repeat interview. Proportions were 52 percent for adult reporters and 41 percent for nonreporters. There were no appreciable differences in these proportions among persons in different attitude groups. Although the group for whom the respondent remained the same for all 4 months was almost half the size of the original group, this restricted group had the opportunity for about four times as much illness experience. (In general, the relationships between illness attitudes and morbidity for this restricted group with the longer period of morbidity experience did not vary greatly from the relationships obtained for the second repeat interview group alone.)

Illness incidence rates for persons with different illness attitudes are shown in table F-5. These rates are for only those persons whose respondent was the same for four consecutive monthly interviews. In general, incidence rates of acute illness vary inversely with the number of symptoms designated as sickness, while rates of chronic illness vary directly. Tables F-6 and F-7 present the incidence rates reported on the same interview in which illness attitudes were reported. The rates are larger than are the 4-month rates since supplemental questions about medical care for illness and symptoms of illness were asked in group II second repeat interviews. Incidence rates for chronic illness generally increase as the number of symptoms judged to constitute "sickness" increases, but the rates for acute illness do not show a consistent relationship with illness attitudes. The relatively severe illnesses, those with activity restriction or medical attention, behave in about the same manner as the less severe illnesses, those without activity restriction or medical attention. On a priori grounds, one would expect that a person's illness experience would influence his attitudes toward illness and, conversely, that his illness attitudes would influence the amount of illness reported. When one considers that these factors may operate differently when a reporter is responding for himself than when he is reporting the illness experience of other family members, the situation becomes even more complex. It is small wonder, then, that the relation between the number of symptoms designated as illness and the relative volume of illness reported does not show a consistent pattern.

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U.S. GOVERNMENT PRINTING OFFICE: 1962 O—641909